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Industrial FINISHING

Reg. U. S. Pat. Office

Devoted to Product Finishing in the Factory

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Letters from Readers

OF INDUSTRIAL FINISHING

Editor's Note—These letters have been promptly answered and all of the inquiries have been referred to advertisers in the magazine. They are published here to indicate or suggest certain interesting trends of thought and activity in the industry, and to encourage further inquiries, comments and suggestions. The names and addresses of firms or individuals whose letters are published here may be had by writing to this office, or letters sent to them in care of this office will be forwarded at once.

Wood Finishes

We would appreciate your advising us what colors are required to make the following finishes, and also where we could get samples of these finishes:

Blond maple
Amber mahogany
Light old world mahogany
Dark old world mahogany
Early American mahogany

Awaiting your reply with much interest and thanking you in advance we are—A. A. Co. (Caskets).

Cleaning and Bleaching Antique Furniture

After reading several of the questions and answers in November issue of INDUSTRIAL FINISHING we decided to write you regarding the cleaning and bleaching of antique furniture. We would like to know the most economical and efficient method of cleaning for use in a small shop. If you can give us this information or refer us to someone who could, it would be greatly appreciated.—I. N. Co. (Wood Products).

Cracking of Crotch Veneers

One of our good friends, The C— Furniture Co., has written us with reference to magazine articles or other printed matter concerning the checking and cracking of crotch veneers, and how such trouble may be avoided. They wish to have this information available to show customers who make inquiries concerning furniture in which this trouble has developed.

It occurs to us that since finishing plays a very important part in checking and cracking, you may be able to send this dealer an article which you have printed on the subject, or tell him where complete information concerning the matter may be obtained. Anything you send will be greatly appreciated by C— Furniture Co. and ourselves.—N. A. F. M.

Steel Cabinet Finish

The writer read with interest an article printed on page 67 of December issue of your magazine, the title of which is "Little Things Count—Toward a Quality Finish."

I am interested in knowing the manufacturer of these steel kitchen cabinets. Our interest is prompted by the fact that we have a particular piece of merchandise ideally suited for their baking conditions.—T. A. Co. (Varnishes, Paints & Allied Specialties).

Graining Paper

On page 65 of the December issue of INDUSTRIAL FINISHING, we read a letter by A.R.J.Co. regarding a transfer paper of the proper texture for graining hospital tables. We are confronted with this same problem and would, therefore, appreciate you furnishing us with the name and ad-

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dress of the manufacturer of such paper.—D. R. & N. Co.

Could you tell me whether or not there is a burl or crotch walnut transfer that can be used to cover a pine panel or top ⅝x10x19-in. with a shaped edge? If there is, please tell me where I can obtain some.—F. C. Shop.

Black Enamel

Will you put us in touch with the manufacturer of an enamel, either synthetic or otherwise, that will have the following properties:

It must cover in one coat on black hot-rolled annealed sheet iron; dry at room temperature which is outside temperature varying from 30° to 90°F.; must dry overnight to allow crating next day; must be smooth with a high-gloss finish; when sprayed on, must be hard and durable; and must stand 400°F. temperature without discoloring. This material is to be used on the exterior of air-conditioning systems. It will be applied with a spray gun. The colors will be white, black and varying.

If you can tell us where we can obtain material that will fill the bill, please advise us, or put manufacturers in touch with us.—M. T. Co. (Stove & Furnace Works).

Waterproofs Small Fiber Articles

The writer has read several inquiries you have published at various times for a waterproofing for small fiber articles, including the inquiry in December issue from D. R. L. Co.

We manufacture several waterproofing compounds and have one article that can be incorporated in the pulp, and the finished article will be waterproof. We will be pleased to receive a sample of these articles and will gladly advise if our products are adaptable for their requirements. —S. R. Chemical Co.

To Recover Solvents

In your December issue of INDUSTRIAL FINISHING you mention, on page 24, a method of reclaiming used solvents. Will you kindly advise the writer personally the name of the manufacturer of the still? We are interested, and would appreciate it if you will give us the name of that

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company.—T. L. Co. (Art Metal Works).

We have given this inquirer the names and addresses of three concerns that manufacture and sell solvent recovery stills or purifiers.—Ed.

Burn-in Patching

Will you please be kind enough to supply us with the name and address of the man who wrote the article "Burn-in Patching" on page 19 of your December issue? We have read this article with much interest and think it is very thorough and one of the finest of its kind that we have ever had the pleasure of reading.—Universal Shellac Stick Co.

In the December issue of INDUSTRIAL FINISHING the article on "Burn-in Patching" interests me very much. I would appreciate your sending me the name of the manufacturer of the stick lacquer mentioned in your article.—E. Mfg. Co.

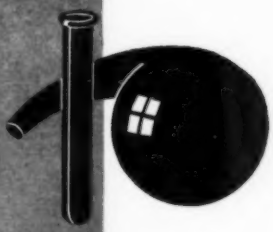
Leather Finish

It has been suggested to us by John W. Masury & Son of Brooklyn, N. Y., that you could give us the information we are seeking. We are interested in securing a source of supply for a paint to be used in the channels or creases of embossed and creased designs on billfolds made of steer hide leather. We would like to have a small sample tube in a green shade and some other appropriate color for this purpose. If you can refer our request to someone, we would be very grateful; or, if you could give us the name of a manufacturer from whom we can secure this, we would appreciate it.—T. E. O. (Leather Goods).

Galvanized Pail Coating

We are confronted with a problem in manufacturing a certain type of utensil that must be made of galvanized iron for certain reasons in fabrication. Certain parts of the iron require soldering together for proper assembly. This galvanized iron vessel (which somewhat resembles a bucket or pail) is to be used to contain a light solution of copper sulphate in water. Copper sulphate, of course, is very destructive to the zinc coating on galvanized metal, and it is necessary to coat or pro-

(Continued on page 87)



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Finish Durability Tests

Here are some vitally important things to think about if you make tests, or if you are planning to make tests on certain finishing materials, or if you purchase (or sell) finishing materials on the basis of what is revealed by certain tests . . . . or if you are opposed to making any such tests.

BY GREGGS PHILLIPS

IN THE SELECTION of a finish for any specific purpose the question of finish life is an important consideration. From steel lockers requiring exacting tests for mar and abrasion resistance of the finish, to automobile license plates which must retain their color and appearance on a

full year of outdoor exposure; from the most expensively finished custom furniture to exquisitely styled and finished compacts and gadgets for milady's hand bag . . . . each finisher has an individual problem to determine the finish that will provide the greatest number of durability miles per dollar of finish purchase cost.

Finish life, depending to a large extent upon chemical changes and conditions, cannot be determined with the aid of an adding machine and a few test tubes, in a manner similar to what is used for determining the lasting qualities of many simple mechanical devices. It can be predicted to within certain limits of probability errors but, like a human life, it can be comparatively short or abnormally long, depending upon the influences of extenuating circumstances and other courses of events during the life cycle.

Confidence in Supplier

Not being expert in the formulation and manufacture of a finish, consumers must place a great deal of blind confidence in their suppliers' skill and judgment, in the recommendation or in the development of a finish for any specific purpose. Often a finisher can be completely overwhelmed with the seemingly numberless prescriptions offered for his finish ailment, with the result that many times special corners are reserved where samples can be run through a gauntlet of acceptance tests before being turned over to the finishing foreman for his opinion. Such a practice can lead to a testing set-up as complete and accurate as the Bureau of Standards but which, to the average finisher, would be a burden of expense and lead to ludicrous tests and practices such as were described recently in this magazine.*

With all due sincerity, a finisher recently asked for recommendations of testing equipment which would arrive at a definite yet simple and practical method of determining, with some satisfactory assurance, the relative durability of finishes. Finish life cannot be accurately predicted because it depends upon such a large number of different factors. Various reagents and methods can be used to bring a finish to a premature failure, but the results of such tests must be considered of empirical value, even if the data so obtained can be coordinated with actual durability which may run into a period of years.

Accelerated Weathering

Accelerated weathering tests can be employed to determine the relative durability of one or more finishes but, even with some reliable key which would interpolate the equivalent in months of actual exposure, the result of the test should not be taken as a true indication of the actual finish life because the tests have not subjected the specimen to a complete duplicate of all the variables entering into the actual service conditions.

To even better than an average size consumer of finishing materials, the installation cost of an artificial weathering machine is almost prohibitive. Hence such tests as salt water and caustic-solution immersions, abrasions, finger nails, flexibility, oven, and

*Refer to "Tests That Fool You & Tests That Are Really Practical," by W. T. Smith, July and August, 1937, issues of this magazine.

other types of tests are commonly practiced to determine whether the finish can "take it." Such tests will often produce freak results and, without an almost academic analysis of the data, lead to conflicting conclusions.

Tests Can Be Misleading

For example, a panel of Finish A, subjected to a salt water immersion, returns 30% greater resistance than a panel of Finish B. On the face of this evidence it might be concluded that Finish A will have a longer life than B. This conclusion, however, would be erroneous unless there is no question that the test specimens of both panels were known to have had the same thickness of finish, in addition to being absolutely sure that the finish films on each panel were completely dry—that is, bone dry, cured, oxidized or polymerized from the outer surface right through to the underlying metal.

Furthermore, there might be some other remote and almost latent cause for the earlier failure of Finish B, such as an application defect which permitted the salt solution to work itself under the finish film, resulting in metal corrosion and thus causing the finish to flake away from the corroded portion of the metal. Where the application is at fault the earlier failure should not be attributed to an inferiority in the finish.

Break-downs with other chemical reagents — whether they be caustics, mineral or vegetable oils, soaps, alcohol, or solvents—would be subject to the same inconsistencies, and test results should be interpreted with similar considerations. Other types of premature failures can be produced by baking panels at a high heat to accelerate aging; rubbing panels with a weighted sheet of abrasive paper; exposing panels to ultraviolet rays to kill color and gloss.

Probable Life in Actual Service Is a Question

All such data can be painstakingly recorded against a specimen of finish and, after the results are tabulated, there is still no answer to the concrete question as to how long the finish will stand up under the service conditions of the finished article. True enough, such a study will reveal a number of interesting properties of a finish, but these factors tell nothing about actual service.

The tests are not a real reproduction of the usages which the finish will receive in the field, because the durability, arbitrarily shortened, is not the same picture such as is projected on a movie screen in dimensions of feet from a frame on the film measuring in inches. However, the results of such tests could be compared with the test results on a finish of known servicability which, after all, is a matter of guess work for the manufacturer of finished articles who would know only of those exceptional cases of finish failures brought to his attention.

The "dear public" just does not have the habit of writing in to a manufacturer, stating that such and such an article has been in daily service for two or more years and the finish has not yet worn down to bare metal or wood. The finish supplier may possibly have a more definite conception of durability and, with tests tending to premature finish break-downs, he can determine, by comparison, a reasonable life expectancy.

Baking and Bending Test

There is one simple test which will tell in a few hours a great deal about the life of a finish. Data developed with a heat aging test, coordinated with a reasonably certain servicability, is very significant. Test specimens are prepared by flowing the finish on to strips of metal foil; air-drying or baking the finish, depending upon its type; and then bending the strips over a mandrel, taking the number of reverse bends required to break the finish film as an indication of the initial flexibility. A duplicate specimen is placed in an oven at 200°F. for 40, 60 or 100 consecutive hours; it is cooled and then bent around the same mandrel to point of film rupture. Comparison of the number of bends before and after baking will represent, in some measure, the flexible life of the finish.

With varnishes, oleo-resinous and synthetic-resin enamels, this test is very significant of the comparative oil length of the material. A furniture manufacturer who has used a certain grade of varnish for many years can, in a short time, safely tell whether some new offering has the "intestinal fortitude" which he believes necessary for his needs. With enamels, the test will indicate the tendency of the material toward increasing brittleness as it ages, as well as yellowing tendencies in whites.

There is almost no limit to the number of types of finishes capable of being compared by this method. Naturally enough, the baking temperature and time will have to be varied according to the type of finish. Lacquers should be baked out at a much lower temperature; 125°F. would be high enough. Conclusions should be based on the average of three or four readings, before and after baking, rather than single test strips. Admitted that this test is not 100% flawless or foolproof, it does bring out an admittedly fair estimate of the aging properties in comparatively few hours. While it does not, of itself, tell the whole story, its practical significance can be fortified if the results may be coordinated with durability performances of some degree of certainty.

Finishing Material Properties That Can Be Measured

Testing of the raw finish is of importance to the large consumer. Mass finishing today can be put upon almost the same plane as automobile production, therefore, with each operator in the finishing department assigned to one particular phase of production, it is often necessary to establish specifications on the finish. Such requirements may specify color, gloss, baking or drying properties, reduction, gallon weight, viscosity, storage stability, adhesion, coverage—and they may even go so far as to establish the proportions of pigment, vehicle and non-volatile. These properties can be measured with precision; the consumer can take samples from each shipment for the purpose of rejecting any consignments not meeting with these requirements, because failure to might result in non-uniformly finished merchandise. While these specifications are definite and for the most part physical, they have no special influence on durability which is dependent upon chemical factors.

Many Factors to Be Considered When Selecting a Finish

Whatever may be said to the favor of a finisher in making his final selection upon the basis of finish durability, there are other factors entering into the selection of the finish. These are of economic consideration, depending upon purchase cost, coverage, and the like. If durability were the only factor of consideration, finish buying would be greatly simplified because cost angles could be entirely disregarded.

With a foolproof system of accelerated durability tests and correlation of the data to long range life, there still remains the question of latent mishaps in application which would impair the life available in a finish. Variations in application are to be expected and unless they can be completely eliminated by finishing in atmospheres controlled for humidity and temperatures, and applied at constantly controlled rates by means of precision flow provided by the most exact atomization of spray, dipping rates, accelerated life tests, in a major sense, will prove to be so much wasted effort. Like a large factory operating with precision control instruments, if the instruments are not constantly checked the entire works can go "hay wire" within the course of 24 hours.

Where finishing materials are made.

"Here's Your Finish"

The above title appears on a small booklet published and distributed by V. J. Dolan & Co., 1830 N. Laramie Ave., Chicago, Ill. In the introduction, the company says: "We hope you're not ready to 'pass on' to your ultimate 'finish,' but as usual, we want to be a little ahead, so we give you all the dope on 'your finish' in advance."

Contents include names and brief descriptions of Dolan's "Unquestionable Quality" wood finishing materials which have been "hits" in the industry. Added "Finish Suggestions," "Period Furniture from 1400 A. D." and a bit of comedy complete this interesting and informative booklet. Several thousand copies have been distributed but if you are a user of wood finishing materials and have been missed, send for a copy.

Multi-Wash Dust Collectors

Sixteen pages of information and attractive illustrations in a new 2-color catalog 8½x11-in., give you a definite picture of what the Schneible multi-wash dust collectors are like, what they accomplish, where they are applicable, where they are installed, how they operate and why they are desirable in certain industrial establishments. The manufacturer guarantees this equipment for five years against repairs and replacement of parts due to wear suffered under regular operating conditions—and lists hundreds of satisfied users.

THE FINISHING OF *High Grade Furniture—I*

A practical article explaining operations and materials used in finishing high-grade furniture and radio cabinets. This first part of the article calls attention to condition of wood when it is about to enter a finishing room, its moisture content and smoothness of surface; also staining and various stains available.

BY R. JAY BURNS

AN INQUIRY from a manufacturer of furniture in Mexico states that, "We use veneer of Oriental walnut, striped American walnut, butt walnut, half-round walnut and some maple. In the solid woods, we use magnolia, sycamore and elm. We are interested in obtaining the best methods of finishing these woods."

From the wood used we assume that a fairly high grade furniture is being made. Not knowing whether this is dining room, bedroom or occasional furniture, I will write in generalities rather than try to give specific schedules.

Moisture Content of Wood

The first thing I would do is see that the lumber contains the proper amount of moisture. If the moisture content is high, the piece will become dry after it is finished and this usually causes sunken glue joints and shrinkage of the finish. Too little moisture in the wood at the time of finishing will result in swelling of the piece. This may cause ridges at the glue joints and distortion of the finish.

In most climates a moisture content of 7% is about right for most woods. This will vary somewhat. The best rule to follow is to have the wood contain about the same amount of moisture before it is finished as it will contain after it is put in use.

A drykiln or a room where humidity and temperature may be controlled is good insurance against too wet or too dry wood. However, it will do no good to condition lumber in such a room and then let it lay around some place where the humidity is not controlled, as it will take on or throw off moisture in a very short time. It should be conditioned just before entering the millroom.

The U. S. Forest Products Laboratory at Madison, Wisc., has done extensive research work on this subject and has data that is helpful in preparing wood for furniture.

Surfaces Smooth and Clean

Before going into the finishing room, it is well to look into the millroom. If the work is properly

surfaced here, it will divert many headaches from the finishing room. The work must be smooth and it should be so handled that a minimum amount of puttying will be required.

The sanding operation will probably pack some dust into the pores of the wood; if so, this should be removed. This is particularly true where belt sanders are used. More often this operation is performed in the finishing room. A stiff brush may be used to loosen the dust; then it can be blown off with compressed air. Failure to properly perform this operation can cause considerable grief. The stain may soak into a dust-filled pore and not dry, making it hard to properly fill the pore. When lacquer is applied over a wet pore it will usually cause a gray spot, due to some of the lacquer solids precipitating at this point. Gas may also form in this wet pore and later escape into the lacquer film and cause a pin hole.

Staining the Wood

Staining is one of the most particular of all finishing operations. It requires great skill, a good eye for color and a knowledge of mixing colors. Even though a piece of furniture were made of all walnut, a staining operation would still be desirable. Stain will even the color of the wood and bring out the natural beauty of its grain and figure.

Where several kinds of woods are used in one piece, such as is indicated here, it is necessary to stain the entire article to obtain a uniform color.

There are several kinds of stains but we are concerned here with only about four of them. Aniline dye, a coal-tar derivative, is the base of each of these stains. These stains are made to be soluble in certain liquids. A dye soluble in one liquid is not readily soluble in another liquid.

Water Stains

The stain that has had the widest use on high grade furniture in the past is water-soluble anilene. It penetrates only the surface of the wood, thus insuring a uniform color. It has a clear sharp tone, as contrasted to the muddiness of some other stains. It is light-fast and low priced.

The disadvantages of water stain are several. Water enters fibers of the wood, causing them to swell — making a smoothly sanded surface rough again. In order to again smooth the surface it is customary to spray on a wash coat of shellac—about 1-lb. of shellac to one gallon of alcohol. This thin coat dries rapidly and causes the surface fibers to stand erect. They are then cut off with fine sandpaper.

Water stain should dry overnight before succeeding finishing operations are performed. This does not always fit in with modern finishing schedules.

Since water stain powders dissolve more readily in hot water, it is usual to bring the water to the boiling point and then stir the powder into it. The same proportion of powder and water must be used for each batch; otherwise a difference in color will occur. The water should always be at the same temperature, as more of the dye will dissolve in hot water than in cooler water. The stain should be cold before being applied, as a warm stain will penetrate more deeply into the wood.

Penetrating Oil Stain

The stain powders for penetrating oil stains are made to dissolve in such light oils as benzol, naphtha, toluol, turpentine, etc. They are referred to as oil black, oil red, oil yellow, etc. As a rule they are used only on the cheaper grades of furniture.

Oil stains have the virtue of not raising the grain of the wood, thereby eliminating a sanding operation. The wash coat of shellac is still needed, however, as these stains have a tendency to bleed into succeeding finishing coats. If the shellac bleeds the stain slightly, this is desirable as it tends to even the color.

This stain has two bad faults that make it unfit for high grade work. It fades more rapidly than water stain and, since it penetrates further into the wood, an even color is not obtained. It goes farther into a soft spot in the wood than in a hard spot, leaving the hard spot darker in color.

Pigment Wiping Stain

Pigment wiping stain is sometimes called "surface stain." It is in solution with linseed oil and is combined with pigment, such as sienna, umber, etc., to give it color. Turpentine and solvent naphtha are usually added to reduce it to a working consistency. It is sometimes used alone but more often is used over a water stain on furniture that is to be highlighted. It is particularly effective on maple. It is light fast but has a tendency to obscure the natural grain of the wood.

Non-Grain-Raising Stain

This type of stain first made its appearance about eight years ago. In spite of being the baby in the stain family, it is used on high grade work, probably more than any other stain. It combines the good features of both water and oil stains, with few of their faults. It goes hand in hand with quick-drying fillers and nitrocellulose lacquers in the evolution of wood finishing materials.

The same stain powder is used as in water stain. The liquid is such that, when sprayed on, it does not raise the wood grain. It has the same even color and light-fast quality as water stain. It requires no wash coat of shellac and no sanding. However, in comparison to water stain, it costs more. This increased cost is usually more than offset by the cost of the wash coat and sanding operation for water stain.

When sprayed on, this stain dries to recoat in about half an hour. This quick-drying characteristic makes it particularly valuable in modern finishing schedules. If any method of application other than spraying is used, this stain loses much of its value. When brushed or dipped, the wood becomes wetter and this usually causes the fibers to swell so that a wash coat and sanding operation are necessary. The wetter coat also requires a longer drying time.

It would seem, then, that the best procedure on an all-walnut piece would be to simply spray a light coat of non-grain-raising stain over the entire piece, to even the color and bring out the natural grain.

On a piece built up of several kinds of wood—such as a table having one or more cheap woods in the pedestal and having a walnut top—we would probably spray

a light coat of non-grain-raising stain, in a walnut color, over the entire piece and then brush a walnut pigment-wiping stain on the pedestal. This pigment stain would be wiped off in such manner as to form highlights where desired. It would give the cheaper wood the same color as the walnut top and obscure the grain so that its difference from walnut would be less noticeable.

In finishing Early American furniture, I would suggest a light spray coat of non-grain-raising stain, followed with a wash coat of shellac or lacquer. When dry, the surface should be lightly sanded with fine sandpaper. A coat of pigment wiping stain may be applied and the surplus wiped off in such manner as to give the desired color variation.

In the second installment of this article, to appear next month, the author takes up fillers (their application, wiping, drying, and some troubles that occur after filling) sealers and finishing lacquers.

Paint, Varnish, Lacquer Book; A Glossary of Terms Used

The regular and special shop names and terms used in the paint, varnish and lacquer industry are alphabetically listed and clearly defined in Ray C. Martin's new book of 96 pages 5¾x8¾-in., bound in heavy green paper. The name of the book is "Glossary of Paint, Varnish, Lacquer and Allied Terms." It is an excellent reference book for both old timers and beginners in the industries using finishing materials, as well as those that manufacture paints, varnishes and lacquers. Price of the book is $1.00, from American Paint Journal Co., 3713 Washington Ave., St. Louis, Mo.

Binks Mfg. Co's. Exhibit at Auto Service Industries Show

At the Automotive Service Industries Show, held December 6 to 11, 1937, at the Navy Pier in Chicago, the Binks Mfg. Co's. exhibit occupied 960-sq.ft. of floor space. Among the Binks' exhibits were a complete paint-circulating system and a late-type water-curtain spray booth at which an artist painted beautiful landscapes in 10 to 15 minutes with a standard production spray gun.

During the week the Binks Mfg. Co held its annual sales convention which was attended by representatives of the entire Binks organization, from all parts of the country. A view showing part of the Binks exhibit appears in the accompanying illustration.

Synthetic Finishes for
LAUNDRY EQUIPMENT

by C. R. Morley

THE LAUNDRY, a name allied with cleanliness, is certainly one of the "bright spots" where paint should receive due consideration. The wide-awake laundry owner and his organization, in keeping abreast of the advancements in modern machinery equipment, cleaning solvents and solutions, etc., should in like manner be apprised of and investigate the newer paint-like coatings for machinery, general maintenance work and delivery truck finishes. . . .

A new type of finish has been presented in recent years which is known as "Synthetic Enamels." These products are chemicals in every sense of the word. They present a finish that has been largely responsible for changing the pace of industry by virtue of their great versatility. These materials may be used on such equipment as dryer units, ironing machines, heater units, washers, delivery trucks, and for general interior maintenance work. This type of finish has the following merits: Great durability, great flexibility, excellent appearance, high luster, great covering capacity, and it will withstand abuse by the elements and by acids and alkalies. The last mentioned point is certainly of great importance where strong alkali cleaning solutions are used.

In the logical cleaning, handling and finishing of a machine unit for service in a modern laundry, where chemical-resistant coatings are employed, the following procedure would take place:

Preparation of the Surface; Cleaning

Preparing the metallic surface of a casting or a sheet metal surface is very important inasmuch as the entire life of succeeding applications of paint-like coating are in the balance. The surface should be free from rust, dirt, oils and grease. Rust and dirt can be removed by sandblasting or wire brushes. Grease is removed by solvent cleaning, the solvent mixture having in its structure a solvent capable of dissolving grease. In any event the application of any type of paint-like coating should only be applied over a surface properly cleaned and free of rust and grease. Immediately following the cleaning operation the first coat of paint-like material, known as a prime-coat, is applied.

Primer; Surfacing Applications

This application of a primer coat, next to the bare metal, may

be either by spray gun or by brushing. It is needed to insure penetration into the pores of the casting, around the boltheads, etc. Such a coating, made of synthetic resinous compounds, has elasticity and toughness, and having greater adhesive properties to the metal it presents an excellent foundation coat for succeeding materials.

Since from an economical standpoint nitrocellulose lacquers, which have in their structure proportionate amounts of synthetic resins, are used; a lacquer primer-surfacer (economical from a rapid drying standpoint) is applied over the primer coat. The surfacing material tends to fill the metal surface defects such as casting pits, etc., and usually several applications are sprayed on. If pits and other depressions are too deep, a lacquer putty applied with a flexible knife is used. In any event, a smooth and level surface is secured. Machinery painted in color not only improves production but adds to the thought of "cleanliness."

Synthetic Enamel

After sufficient drying of the primer surfacer the surface is carefully sanded and the synthetic enamel is applied directly to this surface. The synthetic enamel (spray application) will dry to touch in a relatively short time (one to three hours) and will dry hard overnight. The resultant gloss is very high and when thoroughly dried it presents a film of great durability. Synthetic enamel, which requires a longer period of drying than the synthetic lacquer, may be force-dried (baked) or air-dried for prolonged periods (depending on the type of synthetic, and covered by recommendations of the manufacturer). These finishes that include synthetic resins have many decided merits in comparison to previous finishes.

Lacquer Finish; Machinery

Synthetic lacquer may be sprayed directly over the primer-surfacer. When the wet spray coat of lacquer has been applied it knits firmly to the previous coating, thereby making one heavy and cohesive film. Several coatings are applied—making allowance for suitable drying between applications. The final finish may be rubbed and polished. Synthetic lacquer films are higher in luster than conventional lacquer, the finished coating having the appearance of an automobile finish. A matter of great importance to the laundry industry is that of chemical and alkali resistance. Such direct immersions as 5% solutions of NaOH (sodium hydroxide) for periods of 24 hours will illustrate the general resistance of the finish to corrosive agents. These finishes withstand repeated washings with strong soaps and cleansing agents. Such finishes are also resistant to various fumes, gases and liquids.

General Maintenance

From the standpoint of "brightening up" the interior work rooms of a laundry, paint materials that resist the fumes which are found in a laundry are recommended. Such products are available and should be selected from the standpoint of their resistance to fumes, steam, etc.

Truck Finishes

To alleviate the great detail involved in describing the various

stages of truck finishing, suffice it to say that present day lacquers composed of synthetic resins are considered more resistant to the elements than the previous type of finishes. Trucks are being finished in synthetic enamels, which are considered an economical finish and which are being used in automotive production establishments in increasing quantities.

Edwin F. Cathcart

Scores of telegrams received by the family of the late Edwin F. Cathcart, Vice President in charge of sales for The Arco Co., Cleveland, Ohio, express the sorrow of the paint industry upon his untimely passing December 17, 1937.

Mr. Cathcart supervised the development and production of Arco industrial materials since 1934. He was well known and admired throughout the industry. Many will remember him as the ambassador who in 1920 introduced commercial pyroxylin lacquer into Europe.

Although only 46 years of age, Mr. Cathcart had been associated with the development of lacquer since his graduation from Rutgers in 1911, when he first entered the laboratories of DuPont Co. at Parlin, N. J.

In 1922 Mr. Cathcart established The Glidden Co.'s lacquer department, holding the position of director of industrial sales from 1930 until 1934, when he resigned to join Arco.

Trailer Showroom of Artistic Finishes from Stille-Young Corp.

An art gallery of 200 distinctive new finishes for fine hardwood furniture and metal work is attractively presented in a trailer which the Stille-Young Corp. of Chicago, Ill., and High Point, N. C., is sending around as a traveling "At Your Door" exhibition, service and convenience for manufacturers who use finishing materials.

Many designs of full size dresser fronts, completely finished, are shown. Also a large selection of walnut, mahogany, maple and oak panels in different figures, grains and finishes. Inspection of this traveling art exhibition enables factory executives to see and appreciate the exact effectiveness and richness of the finishes used on different woods and metals.

On one side of the interior are three finished dresser fronts complete with hardware. When a catch is released they can be rolled forward on hinges so as to place each one in full view. There are also 12 panels at the front hinged with special brackets so they can be opened like the pages of a book. On the other side is a beautiful blond maple front in the modern, with the pulls trimmed in green. Above are pulls in different colors showing other combinations that can be obtained.

Along the curve of the roof, special moldings permit 6x12-in. panels to be inserted and slipped out for comparisons.

At the rear are the edges of three dresser fronts; then a crotch mahogany dinette buffet front; next, four more dresser and dinette fronts also

Outside view of traveling trailer wherein finished panels and furniture are shown.

Interior view of Stille-Young traveling exhibition of modern finished furniture

swung on hinges. Around the body, below the showcard panels, other panels are installed in a sort of picture frame effect. A twin bed, with head and foot board complete done in a new maple finish, appears at the extreme left rear. Coming forward there is a reproduction of an early American desk built of solid cherry wood and finished in maple, for two reasons: First, cherry wood always gets a deeper color with age; and second, maple colors are far more popular at this time than a cherry finish.

There are two distinct systems of lighting so that the exhibition can be shown either in daytime or at night. Colonial maple chairs are used. Two file boxes containing 25 finished panels are included; also quite a number of finished carvings for the upholstery trade.

The Revolite Corp. Name Changed to Industrial Tape Corp.

The Revolite Corp., New Brunswick, N. J., announces that beginning January 1, 1938, a change of name takes effect. The Revolite Corp. will be known as Industrial Tape Corp., New Brunswick, N. J.

Products of the Industrial Tape Corp. will be identical as heretofore —"Permacel" the paper masking tape adheres instantly and leaves clean razor-sharp edges for hairline precision in color separation and striping in painting, decorating and refinishing jobs; so flexible, it takes curves without wrinkling or buckling; strongly resistant to lacquers, paints and solvents. "Permacel" is ideal for all around protection. "Jonflex"" is a fine cloth masking tape, strong, flexible, easy to handle and is impervious to lacquers and solvents. "Industrial" is a coarse cloth masking tape, similar to "Jonflex" but with a heavier and coarser back cloth for heavy duty jobs. "Electape,' with the flexible bakelite coating, is suitable for all electrical purposes. "Utilitape" is a waterproof all-purpose adhesive tape.

W. C. Hopkins Dies

Mr. W. C. Hopkins, Secretary of the H. V. Walker Co., Elizabeth, N. J., passed away Sunday night, January 9. He had undergone a recent operation the effects of which caused his untimely end. Mr. Hopkins was 55 years old and had been secretary of the H. V. Walker Co. for the past seven years. He will be very much missed by his colleagues at the Walker Co. and by his many friends in the industry.

Respirators & Clothes

FOR FINISHERS

by E. A. Zahn
Works Laboratory, General Electric Co.

IN MOST of the high-production modern finishing shops where air filtering and correct exhaust systems are in use, it is not necessary for an operator to wear a respirator, unless a paint containing a great amount of poisonous pigments or highly toxic solvent is being used. Where there is poor ventilation or faulty exhaust systems, which do not remove paint overspray quickly enough, it is necessary for an operator to wear a suitable respirator while spraying.

When lead paints are being sprayed there must be additional precautions taken against lead poisoning, and in many cases operators wear complete gas masks for maximum protection. There is equally as much danger from lead paints that are sprayed outdoors due to the tendency of air currents to carry the overspray directly into the operator's face.

A suitable respirator should have an easily adjustable head strap, interchangeable filter pads and a soft cloth covering where direct skin contact is made. A respirator that causes skin irritation is very dangerous because, once the skin becomes broken or irritated, the poisonous pigments find a more direct course into the system than if they were inhaled into the lungs. Many large manufacturers have discontinued the spraying of paints containing great quantities of poisonous pigments; they either apply them by brush or replace them with less dangerous materials.

In such cases where an operator can control his work without moving about more than a few feet, it is often advisable to wear a painter's helmet which covers the head and rests on the shoulders. This is very desirable due to the fact that fresh air can be admitted through tubing from some other source besides that which is contaminated by fumes and overspray near his work.

The clothing worn by an operator while at work should be entirely changed from (or it should completely cover) that worn to and from his work. An entire change in clothing is preferable. Clothing should be made of such material that it will not pick up too much spray dust and paint fumes. It should also be lint free and cleaned at least once weekly. Ordinary clothing will hold paint odors for many hours and the wearer seldom is aware of the fact that the odor is present except when reminded by someone

else who has not been in as close contact with the paints as himself.

When doing high grade work, there is a great deal of trouble experienced from loose cotton or wool fibers getting into the finish coats. Shoes should be changed and a regular painter's cap should be worn while at work because these two articles will carry paint odors and dust more readily than any of the other clothing.

Handling Lacquer Solvents Safely

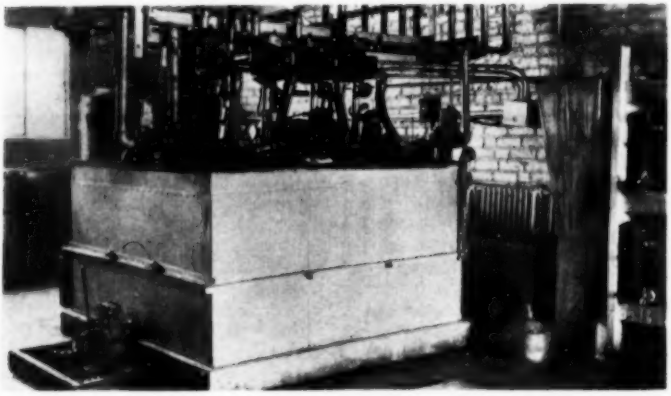
A NITROCELLULOSE lacquer dries through evaporation of its solvents, so these solvents must be highly volatile. Every minute that a solvent is exposed to the air, evaporation is taking place. To avoid excessive loss, the modern lacquer manufacturer does not expose his solvents to the air.

In one of the more modern lacquer plants, solvents are pumped from tank cars into underground storage tanks. Each tank has its own motor-driven pump which forces the solvent to an upper floor of the building, as needed.

These solvents expand in a high temperature, and contract in a lower temperature, hence they cannot be accurately measured by volume. Some solvents expand or contract more at a given temperature than others. A measure filled with one solvent would consequently not contain the same amount as the volume of another solvent. Since the weight of the solvent remains constant, the only accurate way to measure lacquer solvent is by weight. This is accomplished by using a loading tank like that shown in the accompanying illustration.

Several lacquer solvents are blended to make a lacquer thinner, one or more being used for each ingredient in the lacquer. The loading tank floats on a scale, and weighs each solvent as it is pumped into the tank. When the formula is completed the entire batch is released from the tank

The loading tank floats on a scale.



"It will cost too much," said the stoker manufacturer when the Maas & Waldstein Finishing Engineer suggested that a fine finish would improve the appearance of his product.

"It will cost less than the finish you are now using," said the M&W man. "We'll show you."

Mounting a unit on a turntable, he sprayed on a coat of primer, a coat of stipple, and a topcoat of gleaming Metalustre—all in fourteen minutes. This proved how properly selected finishes can speed up production.

M & W representatives are expert industrial finishers. They can help you solve your finishing problems.

Maas and Waldstein Co. Newark, N. J.

Branch Offices and Warehouses . . . 1336 Washington Blvd., Chicago . . . 1220 W. Pico Blvd., Los Angeles

LACQUERS **PIONEERS IN PROTECTION** ENAMELS

and flows by gravity to a lower floor, where it is put into drums for shipment, or used in a lacquer formula.

The value of such equipment and handling is three-fold: By weighing each solvent the lacquer thinner is always properly balanced, regardless of temperature. Since the solvent is kept under cover there is no loss from evaporation and spillage. These solvents are highly inflammable, and by keeping them under cover a fire hazard is avoided. — R. J. BURNS.

Off-Color Troubles

IN THE editorial section of December 1937 issue, page 66, I notice the Editor's comments on "Off-Color Troubles," and his request for ideas or suggestions on same. I have used gravity containers on several occasions and here are my ideas on its use; also, some notations on off-colors and their causes.

In checking off-color troubles, you must first consider the enamel as it comes from the paint manufacturer. If the pigment is not properly ground finely enough there is sure to be a more pronounced tendency for the pigment to settle out.

Where a combination of several pigments are used, the heavier pigments will settle (sometimes even cake) at the bottom, and the lighter pigments will settle according to their respective weights. With the better grade of enamels this condition does not come about as quickly as with the cheaper ones, but in all cases where you are about to use a can of enamel that has been on hand for some time, the stirring operation should be an elaborate lengthy procedure. However, defective grinding of pigments in manufacture is rarely encountered.

I have come across several cases where the shading (that is color matching) operation in the paint factory was improperly performed, some one color being used that was incompatible with the others in the enamel. Under such a condition color separation takes place irrespective of all the stirring that the finisher may do, especially if the enamel is to be used for dipping purposes.

Pigment settling becomes greatly accelerated when the enamel is thinned out for use. In large plants, such as automobile factories, it is the standard rule to keep all enamels constantly agitated once they are thinned out. From many angles it is advantageous to thin out only what is to be used for one day.

It is possible to use a gravity can without any hand stirrer or air agitator, and still keep the enamel properly stirred at all times. The conventional arrangement for the gravity system is a can (with the petcock on the side near the bottom) placed on a ledge or shelf as high as practical above the spray booth and a hose connected to the spray gun. *Now by changing this arrangement a little, one can obtain greater utility and flexibility of operation. Place the petcock or fluid hose valve in the bottom of the can and have same suspended directly over the sprayer by a rope and series of pulleys. Then the container is free to swing with the sprayer's motion, and this keeps the enamel thoroughly stirred at all times.*

Of course, the can must not be

One or More Gallons at Drum Price . . .
Mac-Lac's No. 104 Sanding Coater

A furniture production finish that impregnates the wood. It is easily applied by spray or brush, has wide coverage, sands easily and is a perfect lacquer primer. It dries in ten minutes and sands in twenty minutes. When thinned with one part alcohol to one part coater produces 20.02% total solids and can be thinned with 3 parts alcohol to two parts coater producing 16.22% total solids.

Convince yourself—order a trial sample today at drum price, $1.10 per gallon, delivered east of Mississippi river.

Mac-Lac's No. 101 Pure Refined Shellac
Gloss Finish —Wax Free —Water Proof

Produces a beautiful gloss finishing coat that is water proof. Gives good mileage, can be sprayed or brushed, and dries glass hard. For spraying reduce by adding three parts alcohol to one part No. 101. For brushing reduce 50% with alcohol.

Order a trial sample at drum price, $1.20 per gallon, delivered, east of Mississippi river.

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THE MAC-LAC CO., INC. Date_____
80 Cliff Street, New York, N. Y.

Gentlemen: Please ship the following:

_____ Gals. No. 104, $1.10 per gal. _____ Gals. No. 101, $1.20 per gal.

Name_____

Address_____

Signed by_____ Position_____

filled to the top; and a snug lid must be placed on top, but this lid does not need to be clamped down. With this arrangement it is easy to add enamel or change colors. What appeals to the finisher most of all is that by having the fluid hose exactly the right length, the weight of the hose and the gun does not rest entirely on him. This naturally reduces the possibility of fatigue and enables him to work faster. The rope and pulley can also be utilized to drain the hose when changing colors or cleaning it.

It is not my intention to place the gravity can on a par with a pressure tank for general effectiveness and value. The extra cost of the pressure tank is more than worthwhile. About the only condition where the gravity can is as effective as the pressure tank is in spraying bronze finishes, for very little fluid pressure is required in spraying this finish.—JAMES A. BEDE.

Editor's Note: Come, you foremen finishers, service men, salesmen and chemists: You have had experience with Off-Color Troubles. Tell us about one or more of them. If what you write rates publication, we will pay you for it.

Silk Screen Process Produces Illustrated Booklet

An illustrated booklet (eight pages 6x9-in.) that appears to have been printed with fine type and illustrated with zinc etchings and halftone cuts in black, gray and white and in colors, but which was really produced entirely by photographic silk screen plates, was sent to us recently, accompanied by the following letter from Naz-Dar Co., 4020 N. Rockwell St., Chicago, Ill.:

"We enclose a new booklet describing and illustrating the use of Naz-Dar photographic silk screen plates. This is probably the finest example of fine detail and halftone printing ever made with the silk screen process.

"The circular was printed entirely with the silk screen plates on a regular production run of several thousand. No tricks were employed and no special technique was used other than the usual care employed in fine detail printing. One set of screens were used and they are being held ready for another run, if necessary. The printing speed was 300 impressions per hour.

"As you know, we operate a photographic screen department serving the trade. This branch of our business has grown to the extent that three men are employed in the screen department who do nothing all day but make photographic screens. This service has met with great response from the trade as it enables them to take advantage of skill, experience and equipment that cannot possibly be acquired by an individual process shop. Screen plates made in Chicago are shipped by us to all parts of the country and Canada."

Vice Pres. H. D. Whittlesey with Sherwin-Williams 50 Years

During the evening of December 14 a capacity crowd of the Sherwin-Williams Co.'s directors, officers, executives, department heads, long service employes and invited guests attended a dinner at Hotel Cleveland given by President Geo. A. Martin. The occasion was in honor of the completion of 50 years continuous service of the company's first Vice President, Mr. H. D. Whittlesey, and the completion of 25 years continuous service by 14 other employes. This was followed by Mr. Whittlesey's induction into the 50-Year Club by the two other living members, John Weber and Al Russell.

H. D. Whittlesey, First Vice Pres. of Sherwin-Williams Co. has been with the company for 50 years.

Review and Forecast 1937-1938

NEW *Finishing Materials*

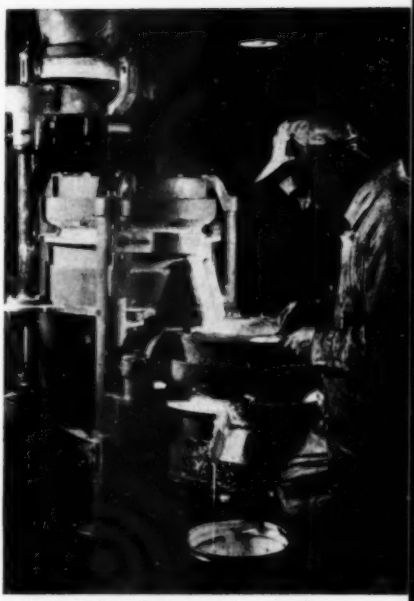
New developments are continually under way in the laboratories of manufacturers.

AN ENTIRELY different line up of finishing materials for products appears this year as a result of the developments and improvements made by manufacturers during 1937. Many of the seemingly impossible things that finish users demanded a few years ago are now available—in both metal and wood finishes.

Probably the greatest progress in the year 1937 has been made with the so-called synthetic type of finish. When you consider that the finisher of metal products can now obtain enamels that will dry thoroughly in one hour or will bake at low heats in 15 minutes and produce a finish quite comparable with the old baked enamels, it is not hard to appreciate the value of such developments to him. Furthermore, when you combine with the above mentioned characteristics the ability of the material to cover in one coat and adhere quite satisfactorily to bare metal, you again realize that a long step has been made in the right direction for simplifying finishing problems. Of course, we must admit that on

in Review

Developed or improved during 1937 for use on products made of metal, wood, fabric, paper pulp, rubber, leather and a variety of composition materials.



Color matching of pigments in enamels.

more particular work, the use of primers and surfacers does produce a better finish.

There has also been steady and sound development behind the manufacture of synthetics. This has greatly reduced the waste of material formerly present and, in addition, an enamel is now produced that gives a far greater coverage and shows a very low cost per square foot for material used.

Of course, research work is going on continually with this type finish and improvements are always being made. Enamels are now furnished in full luster, semi-luster, or flat, and they will air-dry thoroughly in one hour or will bake at a high temperature. The material can be sprayed or applied by other production methods and, in the majority of cases, it will give excellent adhesion and cover in one coat. When you take these facts into consideration you can readily realize that there is little to be desired in the way of all-round finishing material for metal products.

These are only a few of the accomplishments that have been attained by the manufacturer of synthetic enamels.

In the wood-finishing line it would be difficult to compile a resume of the countless new items developed during the past year. New and improved methods and materials have been introduced from all sections of the country and as a

result wood finishes today are greatly improved over those of last year.

There has been a steadily increasing trend toward combination stains and sealers wherein a definite water color has been combined with a sealer. The use of this method of finishing has expanded greatly.

Vast improvement is also noted today in the quality and improved types of concentrated uniforming pigmented stains due to a more careful selection and finer grinding of the pigments.

Fillers it seems, still offer a fertile field for development and it is not improbable that much work will be done along their line during the coming year.

Many claims have been made for improved types of lacquers and tests indicate much progress has been accomplished. New developments embody almost every phase of lacquer, from smoother flowing and less rubbing to added check resistance, greater pliability and durability.

Specialties developed in the past year were numerous, including rubbing compounds which dry dark to resemble the finish and do not show white in corners or routings. Polishes have been developed which embody the combined features of cleaner, abrasive, wax and polish.

New and attractive finishes and unusual colors have been added and, with the increased use of the new and simplified bleach, it has been possible to stain back lightly after bleaching to produce decidedly different effects.

Air-Dry Finishes for Metal

Here are primers, topcoats and one-coat finishes for various kinds of metals and metal products—in whites, blacks, colors and clears—in lacquers, synthetics and combination formulas. They are chiefly noted for such characteristics as excellent adhesion, smooth flowing, lasting flexibility, extensive coverage, permanent color retention and remarkable durability.

Industro Bright Pickle — (A new non-fuming non-tarnishing product.) Removes all tarnish and oxide film from the surface of brass and imparts to it a durable and attractive satin finish. Articles treated with Industro Bright Pickle have retained this finish without showing signs of tarnish for one year on the storage shelves of several manufacturers.

Industro Bright Pickle is a non-fuming acid solution, which is made in concentrated form and diluted

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During 1937 several definite trends developed (or became more marked, as compared with last year) in the metal-products finishing field, and it seems probable that these changes will have considerable influence on the finishing practices of the metal-product manufacturing industry during 1938.

Foremost among these changes is a general tendency to shorten up finishing schedules by taking advantage of new types of finishes which can be applied more rapidly than those of older types. Where such finishes are being used, production is being speeded up, costs reduced, and inventories cut down.

This shortening up of finishing schedules is being accomplished in several different ways . . . .

****The new materials are conveniently grouped under these classifications:**

Air drying finishes for metal—start on page 38
Bake finishes for metal 42
Wood finishes (mostly furniture) 54
Paper, fabric, rubber, leather 62
Miscellaneous 64

Please note the identification number following each listed product. When writing to "Industrial Finishing" for the name of the manufacturer or when sending a letter to be forwarded, be sure to mention this identification number.

with three parts of water. It is used at room temperature. Articles to be pickled are first cleaned with a hot alkali cleaning solution. (Industro 5B, a cleaner used for brass without tarnishing, is particularly suitable for this purpose), and then immersed for about one minute in the Industro Bright Dip Solution. The pickled article is then rinsed, preferably in hot water, and allowed to dry.

The very desirable results described are secured by the formation of an invisible and protective chemical coating on the surface of the metal. No lacquer is used.—161

Non-Tarnishing Metal Lacquers—These materials have been recently perfected so that a thin film of Non-Spotting-Out and Non-Tarnishing Metal Lacquer will protect the metal from tarnishing, whether it is used indoors or outdoors. Excellent adhesion and resistance to abrasion are provided together with the minimum discoloration from aging. These lacquers are used very successfully for such applications as metal store fronts, all kinds of metal railings of brass and bronze both for exterior and interior purposes.—107

Heat-Resisting Lacquers—A new line of clear and pigmented air-drying lacquers, specially designed for finishing electrical equipment and other products normally subjected to elevated temperatures. These new finishes, known as "Durheat" lacquers, retain their flexibility, color, and adhesion indefinitely at temperatures up to 300°F. They are finding application for direct and indirect lighting fixtures, lamp enclosures, radiant heaters, electric signs subjected to heat, electric ranges, ovens, and similar equipment.

"Durheat" lacquers are supplied in clear, black, white, and all colors, and can be applied by either dipping or spraying. They can be applied directly to any metal except polished chromium. When used on the latter metal, the surfaces to be finished are first covered with a baked coat of "Chroprime."—116

Dielectric Enamel (For Electrical Apparatus)—A new black enamel, with special dielectric properties, especially suitable for finishing electrical apparatus, such as steel switchboards and instrument panels, coils and radio bases. Dries to a rubber finish; is tough, durable, and has high electrical resistance; it is applied by spraying. A surfacer, with similar dielectric properties, is also supplied for preparing the surface to be finished with the enamel.—119

Perspiration-Proof Lacquer—A clear lacquer that is applied by dipping or spraying and air-dries out of dust

We find that the greatest progress has been made in fast-drying, tough synthetic enamels. These materials are now made to air-dry with practically the speed of lacquer. Their toughness and hardness, after two weeks, is comparable to that of a baked finish. In our work we use white and very light cream colors. These new materials give us a "hiding power" that is truly remarkable. Although we have made no tests, the paint manufacturers claim these materials to be alkali, acid and heat resistant.—Machine & Foundry Co.

New cellulose compounds have made their appearance which, while somewhat comparable to conventional cellulose nitrate coatings, are rapidly meeting the approval of industry. When made into clear protective coatings, these "lacquers" find a great outlet as clear metal protective finishes for outdoor use. These compounds are available in a wide range of viscosities and possible incorporation with synthetic resins which permit of a solid film formation comparable to synthetic resin varnish. They handle much like the ordinary lacquer and air-dry or may be forced dried, in accordance with industries' wishes.

rapidly. After hardening for a few days, it becomes practically insoluble and resistant to moisture, soap and water, and perspiration. It is useful for finishing products, such as flashlights, that are constantly held in the hands.

Used on steel products, this lacquer provides a much higher degree of protection against rusting than ordinary lacquers, according to the manufacturer. It is also supplied in grades suitable for finishing copper, brass, and aluminum.—122

Tarnish-Proof Brass Lacquer—Manufacturers of brass goods who have had trouble in obtaining a non-spotting clear lacquer providing thorough protection from tarnishing under all conditions will welcome No. 2121. In comparative tests, this lacquer has shown remarkable performance. It insures:

1) Minimum crystal spotting on oxidized finishes.
2) Minimum stain spotting on cast work.
3) No greening in dip tanks.
4) High resistance to hydrogen sulphide.
5) Good protection in contact with rubber.
6) Excellent adhesion.
7) High perspiration resistance.
8) Good exterior durability.—129

Clear Buffing Lacquer—A water-white clear lacquer that does not change the color value of enamels over which it is applied. It has excellent resistance to discoloration even in direct sunlight; air-dries in regular lacquer time and when buffed, develops a full depth of gloss comparable to that of fine porcelain, a highly desirable property for certain types of nameplates. Its outstanding marproofness makes this lacquer ideal for use on compacts, cigarette cases and lighters, as it prevents such articles from scratching and marring when carried in contact with loose keys and change.—135

Unitcoat Flexible Black Lacquer Enamel—A one-coat black lacquer enamel finish for cold-rolled steel, turned or spun items, or any other metal. Highly flexible and will withstand outdoor exposure.—143

Laca-Thetics—These enamels build like synthetics and dry with the speed of a lacquer. Laca-thetics are alkali and acid proof and provide an excellent finish for electrical instruments which come in contact with battery acids or grease conditions.—147

Larcoloid—A synthetic enamel especially adapted for finishing and refinishing automotive vehicles. Air-dries dust-free and "out of tack" in 15 minutes; becomes hard in one hour; the film has that hard, smooth, deep luster of a baked finish and is

Lacquer-enamels having a metallic luster are especially popular this year. These lacquer-enamels can be supplied in a wide variety of pastel or brilliant colors and in different metallic tones.

remarkable for its adhesion, flexibility and durability. The finish is resistant to moisture and solutions of acids and alkalis. The manufacturer recommends thinning this enamel with a special reducer, although turpentine or turpentine substitutes can be used. The finishing material contains no "gun cotton" or explosive ingredients; is available in clear and colors. While this finish can be applied in a thin coat directly to the bare metal, it is recommended to be used over a good primer.—163

Berrylac B—An air-drying synthetic one-coat enamel for metal, wood or composition surfaces; a combination synthetic lacquer; adheres firmly and permanently to bare metal and bare hardwood of close grain like maple. (Open-grained woods and porous composition surfaces require a sealer or prime coat.) It can be sprayed or dipped; reduces 50/50 to 40/60 with lacquer reducer; fills perfectly and levels out beautifully when applied; dries rapidly; becomes a tough hard lustrous film; doesn't print when packed; is suitable for interior or exterior service (but for exterior work a primer is recommended); doesn't become brittle with age; is available in black, white and colors to match samples or suit specifications.

The manufacturer says:

"Do not force dry it; heat retards its drying action. Its adhesion becomes greater with age. Because oxidation is slow it is more difficult to remove the Berrylac film after two weeks than after 24 hours. This is a definite indication of long life and film adhesion . . . . is the result of past experience and leadership in the field of aviation, where flexibility and adhesion are of paramount importance."—185

Quick-drying fillers, for use on heavy machinery castings, are displacing those requiring a day or more to dry.

High-Solids Motor-Car Lacquers—The quality of lacquer that deposits a heavier film in one application than had been practical in the past, making it possible to get sufficient film thickness with two to four coats. This type of lacquer also has easier rubbing properties than previous motor-car lacquer.—186

Flexilacq — A greatly improved product . . . . through the use of some of the new types of synthetic resins that are compatible with nitro-cellulose, the result being a material that has excellent adhesion in one coat to practically any kind of metal.—187

Sanitary Coatings — A variety of sanitary coatings for use on food packages of different kinds, some being practically impervious to alcohol solutions, fruit juices and vegetable acids.—189

Graining by Transfer Film—A synthetic film which incorporates photographic reproductions of materials such as wood grains, marbles and abstract designs. This film can be applied to flat surfaces and one way curvatures by means of a special welding solution which adheres the synthetic film to the face of the

Instead of using special undercoats for each final color, a neutral undercoat is selected as standard. All products are "shop-finished" in this standard and then given a final finish in any desired color by using lacquer-enamels, with a topcoat of clear lacquer, if this is required.

The use of colors in ever greater variety continues. This is another reason for favoring the standard, neutral undercoat already mentioned, as it can be finished in lacquer-enamel of any desired color, and changes in color can be made with negligible trouble and expense.

metal. By this process, inlay and other decorative effects can be accomplished.

A sample department is maintained for the purpose of styling various products with this process and a technical department is ready to answer any questions regarding the application of the transfers to various products.—203

Metalized Bronze Uniperlac—Simulates bronze plated finish on steel and brass and is suitable for lamps, lighting fixtures and metal novelties. —149

Bake Finishes

This classification includes primers, undercoats and topcoats (and one-coat finishes) in smooth and textured surface finishes for products made of cast metal, forged metal, sheet metal and wire. Finishing materials are available in whites, blacks and colors. A few items in this group can be either baked or air-dried.

Porciflex Enamels—Synthetic, with a close resemblance to porcelain in texture, durability and other properties, are available in white and a wide range of colors. A very flexible baking schedule is permitted with this enamel, such as one hour at 260° to 300°F. Where a short baking schedule is necessary, it can be baked 5 to 7 minutes at 375°F. It is also suitable for direct application on the metal without any primer.

These finishes are of superior quality, particularly in the following points: Hardness, toughness, abrasion resistance, humidity resistance, moisture resistance, resistance to discoloration from sunlight and ultra-violet light. Excellent adhesion on bare metal such as steel, brass and zinc die castings.

Due to their superior resistance to ultra-violet light discoloration, the use of these enamels is recommended for finishing refrigerators, air-conditioning apparatus, washing machines, light reflectors, kitchen equipment, hospital furniture, medicine cabinets, electrical equipment, and chemical machinery. A high-gloss finish to a semi-gloss and dull luster, can be obtained according to the requirements of each specified application.—100

Wrinkadur Enamel—A perfected type of wrinkle finish, which has been found foolproof for industrial applications. It is applied by spraying, and requires baking one hour at 250° to 300°F.; available in black and a wide variety of shades; is successfully used in connection with electrical apparatus, sheet metal

---

A new type of thermo-setting enamel, meeting with the approval of industry, is effecting revolutionary changes in speed, hardness and color retention qualities. This enamel, urea-formaldehyde, is intended for use indoors. It finds great outlets in the refrigerator, stove, kitchen and bathroom cabinets and hospital equipment industries.

The enamel is thermo-setting, requiring 250° to 350°F. of heat. White and pastel shades are customarily used. The enamel is very tough and approaches the hardness of fused porcelain . . . .

This type of basic resinous compound is hardened by polymerization rather than by oxidation . . . . It lends itself to incorporation with oil-modified alkyd resins, hence may be used outdoors for metal signs, automotive bodies, etc. Great resistance to abrasion, oils and solvents.

May be made into pale clear varnishes, producing a film resistant to moisture, grease and perspiration.

---

work, metal radio cabinets, auto heaters, machinery, and miscellaneous articles where a pleasing, attractive, uniform wrinkle finish is desired; provides excellent adhesion in one coat on bare metal.—101

Alcohol and Cigarette Proof Lacquers — Supplied for use on metal novelties such as cigarette cases, metal table tops, and other articles where a tough durable finish is required—one that will withstand the effect of burning cigarettes, cigars and alcoholic beverages. These finishes are available in clear and a limited range of colors; require baking from 30 minutes to one hour at 300°F.—106

White Baking Enamel—Cuts costs by eliminating rejects due to discoloration from hot spots in your oven; does not discolor while baking at 325°F.; retains its whiteness after baking; has porcelain-like hardness; bakes at 275°F. in one hour; is unaffected by acid, alkali and grease. —202

Hammered Finish—May be had in either the cloisonne type of hammer or the actual hammered metal effect, and may be had in air-dry synthetic or baked synthetic, and if desired, might also be had in lacquer. This material is applicable to large surfaces and may be sprayed on vertical surfaces without sagging. —111

Burn-Proof Enamel—A high-bake synthetic enamel for restaurant table tops, Masonite bar tops, metal furniture, and other items requiring very resistant finishes. The enamel bakes for one hour at 325° F., and the finished film is resistant to acid, alkalis, alcohol, oil and burning cigarettes.—112

Duflex—A new flexible finish for high grade metal products subjected to extremely hard usage, such as golf sticks and fishing rods. In gloss and wearing qualities it closely resembles the finish produced by extruding or cementing celluloid upon a metal base. The cost, however, is lower.

In finishing a product, such as the metal shaft for a golf club, by the Duflex process, the product is first covered with a primer coat of synpex enamel, which air-dries rapidly and does not require baking before graining. The grain is then applied in the usual manner, (if wanted) and both coats are baked. After baking, the product is given five dip-coats of clear Duflex lacquer. The resulting finish, the manufacturer states, has a deep gloss and is very flexible and durable. Any metal can be finished by this process.—113

Roxyn 11C White Baking Enamel—A synthetic white baking enamel made from a new base which yields extreme hardness and color purity. A fast-baking finish which has remarkable tolerance of heat. While designed to bake on one hour at 260° to 275°F., there is no appreciable color change between such wide limits as 250° to 300°F. This quality guarantees color uniformity in production even though there are such variations in oven temperatures, and thus reduces rejections for off-color work.

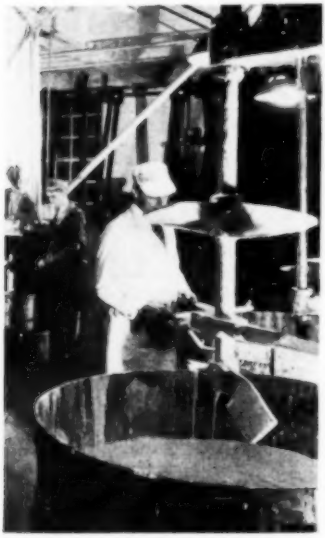
Modified alkyd enamels have made great progress. Industry is becoming more accustomed to their handling. Oil modifications of these resinous compounds made into enamels lend themselves to the complete range of air-dry, force or baking finishes. The modified alkyd enamels have replaced oil enamels and, in a large measure, lacquer enamels, except where speed in air-drying finishes is concerned. Competition between the newer types of lacquers and modified alkyd enamels is going forward. Definite characteristics are found in each.

Another unusual property which prevents rejects is its hardness and marproofness directly on leaving the oven. Handling or assembly, even while the enamel is still hot, will not damage the film. Will not soften under high temperatures, once it has been baked.

This finish is noted for its pure white color and its hard, mar-proof surface. It will not soil easily as it feels like porcelain to the touch. Combined with this exceptional hardness is a high degree of flexibility, indicative of finish life. After a severe aging test (150 hours at 250°F.) finished panels can still be bent around a ½-in. mandrel without failure.—127.

Durtemp — A new baking lacquer that withstands the action of match flames, lighted cigars and cigarettes, perfumes, alcohol, and household chemicals. Durtemp is a gold-colored clear lacquer, which is applied to metals by dipping or spraying and is then baked. It is being used for finishing ash trays, but is also useful for serving trays, vanity cases, and other products requiring protection from lighted cigarettes, spilled perfumes, and other things that are injurious to ordinary finishes.—114

Enamel mixing; color matching.



"Chroprime" — For chromium. A clear primer which can be applied to the metal surface by spraying or dipping, after which it is baked. It adheres tenaciously to chromium and provides an excellent foundation for any kind of lacquer enamel. It resists heat, remains flexible, and permits the metal to be engraved after it is applied. It is at present finding extensive application in the production of automobile name-plates and for other purposes where colors are wanted on a corrosion-proof base. "Chroprime" can also be used as a durable undercoat for finishing other metals.—115

Metal Primer — A new synthetic primer for use on metal products that air-dries out of dust in 5 minutes and, therefore, reduces the rejects due to shop dust and dirt. This new "speed" primer is suitable for use under air-drying lacquer-enamels or baking synthetic enamels, or as a shop coat. It air-dries, or can be force dried or baked, giving a very flexible schedule ranging from two hours at 160°F. to 20 minutes at 275°F. It has good adhesion, excellent building and holding-out properties and is easily sanded. It is supplied in many colors for either dipping or spraying.—117

Two-Tone One Bake Finish — A 1938 dress-up finish is obtained with smooth glossy Ba-Flex in combination with fine-textured Rincon-trol. Unlike most decorative schemes, this system is simple, economical and extremely effective. It is effective because it includes the use of different textures as well as various colors in combination, thus avoiding the time worn practice of merely

"THE APOLLO BELVEDERE HAS ENDURING BEAUTY TOO"

The unknown Greek sculptor from whose hand came the superb figure of the Belvedere Apollo, certainly knew the value of lasting beauty—he fashioned his masterpiece in enduring marble.

And in the modern world, the importance of beauty that endures is even more universally recognized . . . in the trades as well as the arts. For example, the manufacturers of metal articles insist on finishes that combine toughness and durability with "eye appeal." They want a finish that can stand the rigors of processing and shipping and still retain its unmarred attractiveness. In short, they demand an A & W "Tailor Made" finish.

If rejections and returns are jamming your production line . . . cluttering up your inventory . . . see the A & W representative and make his the responsibility for developing a finish that has been "tailor-made" to fit your requirements exactly.

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Builders of Fine Industrial Finishes

In addition to their quick-drying properties, there is a special reason for the increased use of lacquer-enamels. China-wood (or tung) oil has heretofore been an important ingredient of baking enamels, but the supply of this oil reaching the United States at present is being greatly restricted by the Sino-Japanese war. Certain types of baking enamels can be produced without the use of China-wood oil, but air-drying synthetic enamels cannot be made with the highest degree of hardness without this oil. Therefore, if the shortage continues, the use of lacquer-enamels will be greatly extended where air-drying finishes of sufficient hardness are required, and the need for high solid, quick-building lacquer-enamels will be further emphasized.

having a base color striped in another shade of the same material.

Strikingly attractive results are easily obtained. A coat of Ba-Flex is applied to the areas where a smooth finish is desired, and allowed to set up well. (It air-dries in regular lacquer time.) Then, using masking tape or a stencil, the balance of the piece is sprayed with Rincon-trol in the selected texture and color. One bake finally converts both materials to a permanently tough, flexible finish with unusual eye-appeal. Obviously, by working with different patterns as well as colors, the variety of effects obtainable with this "two-tone" system is practically unlimited.

It should be noted that this scheme is not costly, since the first coat of Ba-Flex is sprayed only on those parts of the work where it will appear after the Rincon-trol is applied, and extra baking operations are unnecessary.

The velvet-dull sheen of Rincon-trol on business machines eliminates glare under bright lights, does not show finger prints or smudges. A bright trim in sparkling Ba-Flex adds a compelling touch of sales appeal to any primarily utilitarian device.—136

Ba-Flex Enamel—A product that embodies most of the desirable properties of both cellulose lacquers and synthetic baking enamels. Has a number of specific applications in the machine field as both a decorative and functional finish.

1) Ba-Flex sets up in regular lacquer time, permitting handling in about 15 minutes. This prevents collection of dirt in the finish, which is a constant problem with users of regular baking enamels.

The fast air-dry also permits a decorative coat of a different color or texture to be stenciled on before baking, and the complete finish is then baked in one operation.

2) When ovened for an hour at 275°F. Ba-Flex converts to a marproof adhesive film which, despite its hardness, is still so flexible that it may be blanked and formed if necessary. Where machine parts are painted before assembly, this finish is insurance against costly refinishing caused by damage due to rough handling or accidents; it will not mar, chip, flake or peel.

3) Produces a smooth, eye-warming finish which retains its original

In general, we have followed the trend to finish in fewer coats of paint, to apply baked finishes instead of air-dry types, and to give automatic application every possible consideration. —Mfr. of Electrical Machinery.

appearance under conditions that quickly cause ordinary finishes to become shabby. Has exceptional resistance to perspiration, which contributes to far more finish failures than is generally recognized. It is gasoline and oil proof.

4) For business machines and other

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much handled equipment a neutral shade of taupe harmonizes with and richly complements other colors such as mahogany and walnut. Ba-Flex taupe has the unique property of concealing scratches, fingerprints, dust and smudges which are so readily apparent on, for example, glossy black enamels.—130

Rincon-trol (A Wrinkle Enamel)—Has a pattern or texture which is predetermined and controlled by formulation, instead of being dependent on the skill (or lack of it) of the individual sprayman. Has the qualities which can be briefly enumerated as follows:

1) Uniform appearance on not only all surfaces, but even on separate parts, solving an assembly problem.

2) Freedom from fatty edges, "fish-eyes" and flashes, regardless of film thickness applied.

3) Patterns ranging from close dull textures for fine instruments and machines, to livelier, larger wrinkles for greater areas.

4) Hard abrasion-proof film.

5) Extremely high perspiration resistance.

6) Less dirt collection due to the texture of the wrinkle, proved by comparative tests.

7) Repairability; with Rincon-trol it is only necessary to sand a damaged spot and respray the panel; after baking, the spot cannot be found. Most wrinkles have to be stripped down to the metal for refinishing, as additional coats destroy the original effect.

8) Flexibility when required, to permit blanking and riveting without injury.—128

As for metal finishing, we are still using high-bake D—, or its equivalent, which has been constant with us during the past season, and we are planning to use the same finishes during the next season—Refrigerator Mfr.

Baking Synthetic Enamel—For hospital furniture; made in high gloss form, white and colors, and is non-reactive to iodine, mercurochrome, alcohol and iodoform.—138

Baking Synthetic Enamels (F Types)—In white and colors; can be reduced with gasoline, naphtha, or almost any other type of petroleum solvent. These enamels provide extreme high gloss and the white has positive color retention, even though baked at a temperature of 250°F. for 1½ hours. Dries hard and mar-proof; is applicable for the finishing of tinware, radiator enclosures and other metal objects that require high-grade inexpensive finishes.—139

Wrinkle Synthetic Enamels—The outstanding characteristics of this type of material is that it will wrinkle every time, even in a foul oven, in the presence of sulphur. Suggested baking time—275°F. for 1¼ hours, and may be had in all colors.—141

Metalized Primer Surfacer—For the foundation of the finish; primes and surfaces in one operation on metal, wood and compositions. Covers, fills and dries fast; may be sanded in 10 minutes and topcoat applied immediately thereafter. The leafing action of metallic ingredients insures covering, hiding and filling qualities. This material is an excellent base for oil enamels, lacquer enamels or synthetics (air-dry or bake) and has perfect adhesion and flexibility on all metals.—148

Baking Lacquer L. H. Series—Air-dry out of dust like a lacquer, bake one hour at 250°F. like a synthetic, but are tougher and have more ad-

Although wrinkle finishes are by no means new to the paint industry, constant improvements by progressive paint laboratories have brought us a material that is excellent in every respect.

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Each year has witnessed outstanding Glidden contributions to the great field of industrial finishing.

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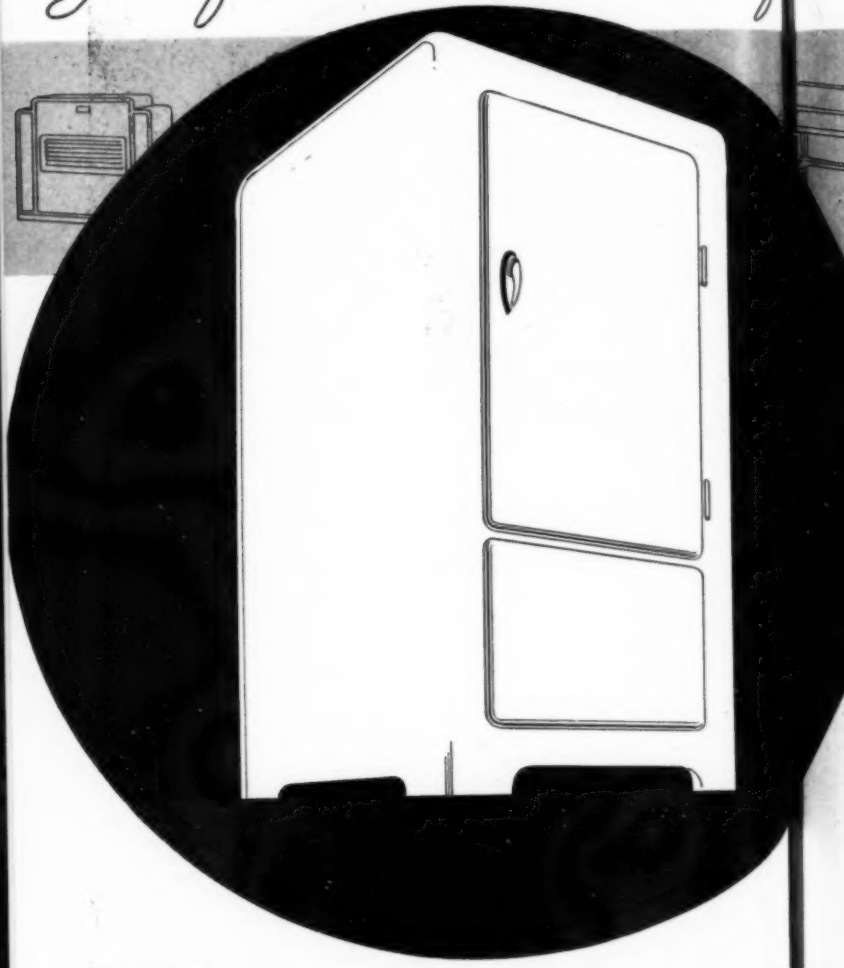

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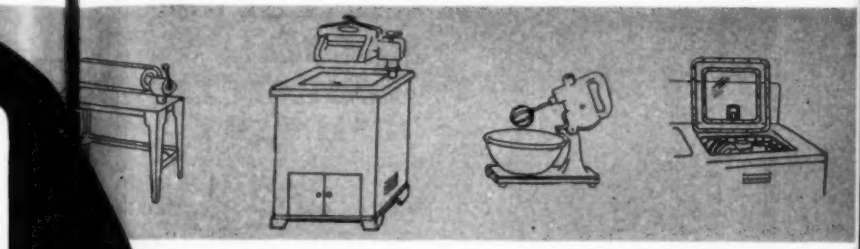

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TODAY a product's appearance is one of the biggest single things that influence a sale.

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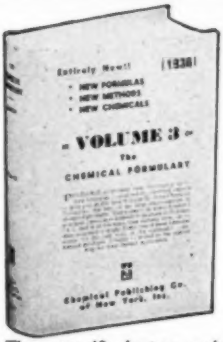
Because people demand beauty. They want to be proud of the things in their homes and offices. They want quality products that *show* their quality. And they're backing up this preference with hard cash.

So *naturally*, articles of every description gleam with rich Du Pont DULUX today —from small fans to filing cabinets and refrigerators. (As a matter of fact, more than 3,000,000 refrigerators now in use are finished with DULUX.)

For DULUX *looks* better and *lasts* longer. It combines unusual gloss and beauty with durability that's unmatched by any other type of finish. It gives any product a real plus *value*...a finish that keeps its high lustre in spite of hard service.

A du Pont representative will be glad to give you full information about this remarkable finish and how it will step up the appearance of your product. E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Del. Canada: Canadian Industries, Ltd., Toronto. Great Britain: Nobel Chemical Finishes, Ltd., London.

NISHES



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The baking time of enamels is being reduced by using enamels that can be baked rapidly at relatively high temperatures.

White baking enamels, for finishing refrigerators, etc., are being improved as to color retention, resistance to marring, hardness, and durability.

Instead of baking each individual undercoat separately, systems of undercoats, all of which can be baked at the same time in one operation, are used.

hesion than a synthetic. Finished metal can be formed and drawn without disturbing finish; takes a high polish on buffing. Included in this series are some finishes that resist concentrated sulphuric acid.—154

Water-White Baking Clear—Does not yellow with age. Produces a very hard glass-like surface that resists solvents exceptionally well.—155

Polymerin — A new industrial finish said to attain the production speed of lacquers and possess the desirable qualities of permanence and durability common to synthetic resin finishes; the result of a distinctive formulation. Its action is due to the principle of polymerization, a chemical reaction whereby molecules combine under suitable conditions to form molecules of more complex and stable structure. It does not dry by oxidation.

Oven temperatures and the mass of metal determine the processing time, which varies between a few minutes and a few seconds. Only one bake is required.

Polymerin provides a suitable finish for washing machines, office equipment, metal furniture, toys, stoves, hospital equipment, plant machinery, electric appliances, and other types of metal products. It sprays freely, or it may be dipped. Tests at the research laboratories show it to be resistant to all common deteriorants. Its characteristics of flexibility and adhesion are reported to be equal to those of any synthetic resin finish.

The finish comes in any color and in any degree of gloss or dullness. Available in a clean white permanent to sunlight; is well adapted for products which are subjected to alkalies, acids and other discoloring agents. In many applications, Polymerin adheres to bare metal without undercoating.

It "sets-up" so rapidly that a dust-free surface materializes quickly. It will not collect dust or foreign particles floating in the air either before or during polymerization.—158

Anavitro—A white baking enamel of excellent properties, having hardness, good color retention when baked one hour at 300°F.; will stand humidity, weatherometer, grease and abrasion tests.—188

Mirotex Appliance Finishes—White Mirotex appliance primer bakes at 300° to 325°F. for 1½ hours, and Mirotex appliance enamel bakes at 250° to 275°F. for one hour; meets rigid requirements of baking enamels as applied to domestic and industrial appliances such as refrigerators, washing machines, metal cabinets, metal hospital furniture, etc. Will stand following tests:

1) Humidity and water resistance; more than three weeks in cold water without softening.

2) Alkali test, for washing machines.

3) Grease resistance; exposure to 50% lard oil and 50% oleic acid at 140°F. for 48 hours.

4) Hardness; is like porcelain itself in hardness and yet flexible and tough.

5) Passes exposure to sulphur dioxide.

6) Salt spray at 10% concentration for three weeks constant exposure.

7) Whiteness; is a perfect white after baking to a deep luster and re-

mains white under all tests including ultra-violet light and darkness; also available in colors.—204

Wood Finishes

The items listed under this classification include practically all kinds of materials used in finishing wood furniture and other wood products — stains, fillers, sealers, combination stain-sealers, bleaches, materials for equalizing or uniforming the different colors of different woods in an ensemble, undercoats and topcoats in clears and colors; also in lacquers, synthetics and in hard-to-define combinations of old and new materials; rubbing oils, polishes, varnish and lacquer removers. Most of the materials listed here are especially designed for use in the wood furniture industry.

Blackboard Finish—A new air-drying lacquer enamel, that finishes wood, fiber, wallboard, cardboard, pressed paper, and other materials with a surface resembling slate. This new finish, known as "Slatite," takes chalk-marks like slate, and the marks can readily be removed with an ordinary blackboard eraser. The finish is washable and durable and, when it becomes worn, it can be readily renewed by spraying on another coat of "Slatite."

"Slatite" is being used for the production of toy blackboards and slates, and also for inexpensive lightweight and portable blackboards for the use of schools, colleges, lecture rooms, engineering and business offices, and stores.—118

Waterproof Lacquer for Wood—A new type of clear lacquer that is especially resistant to water and moisture . . . . for finishing such wood products as handles, tennis rackets, skis, and water toys. One thin dip coat seals the pores of the wood and provides a waterproof coating. A second coat can be used for the final finish, or any suitable finish can be used as the top coat.—121

Fashion Bleach A & B—A modern improved one-application bleach that has been universally approved. Mixed 4 parts of "A" to one part of "B" for average bleaching. If greater bleaching is required, a mixture of 3 to one will be found satisfactory. Gives bleached, blond or pickled finishes, new colors and effects that are pleasing and popular on walnut, mahogany and oak.—123

QCPW (Quick-Coating Pigment Wiping) Oil Stains—Their exceptional uniforming qualities render the matching of table bases to table tops very easy in production. The whole table, made with mahogany

---

In the furniture finishing field consistent efforts have been going forward to produce better finishes. Synthetic varnishes, with their resultant higher solid content, meet with approval. Lacquer coatings with lesser solid deposit, but presenting a more rapid finishing schedule, are still used. The practical incorporation of one of the recently presented cellulose compounds with varnish, hastens the drying and hardening time of such a varnish and at the same time adds greatly to its water impermeability. Newer coatings, of basic cellulose nature lend greater resistance to temperature changes. The sandwiching of greater temperature-change-resistant coatings between lacquer coatings is meeting with success, presenting great fullness, clarity and ability to expand and contract with the basic wood much better than the "drum-tight" lacquer film.

Announcement—

We are pleased to announce the appointment of Mr. Raymond Moore, High Point, N. C., as our Southern district manager.

The men who comprise our organization are well known to furniture manufacturers throughout the country as they have been serving the furniture industry for more than a score of years. They are thoroughly familiar with furniture finishing production problems and they have materials to offer that will meet the most exacting conditions.

Our new plant, located at Rahway, N. J., has the best facilities and equipment with which to manufacture production furniture finishes at low cost.

We invite your inquiries regarding our S-1201 Lacquer Sanding Sealer; W-1001 Gloss Wood Lacquer and F-1601 Flat Wood Lacquer available for immediate delivery.

Complete information and prices will be sent on request.

RUDD LACQUER & SEALER CORP.

NEW YORK OFFICE—80 CLIFF STREET

PLANT—RAHWAY, N. J.

In furniture lacquers the year 1937 brought forth more flats . . . . some of these materials being of spraying viscosity at 25% to 27% solids; others are reduced to proper spraying viscosity. Developments in the synthetic resin field have also aided furniture lacquer because some of the newer types are compatible with nitrocellulose and improve the lacquer film, at good body on the work, in cold checking and print resistance.—Finish Mfr.

top and a birch or light wood base, can be stained at one time without the usual number of extra operations. QCPW fills just enough to give the semi-open-pore effect that is so popular on styled pieces.

A new degree of perfection has been attained in the uniforming of gum and tupelo when stained a walnut color by the use of QCPW oil stain. Dipped, sprayed or brushed, rich transparency is obtained without a noticeable "striking in," black splotchiness, or dark streaks so prevalent in oil stains in the past, when used on these woods.—200

Semi-Flat Lacquer (L-327)—A lacquer achievement worthy of note for manufacturers of upholstered furniture. On carvings and turnings a dead flat or semi-flat finish is desirable. L-328 is a new development to meet this need and is at the same time extra hard. Frames are not scuffed, nicked or marred when going through the upholstering room when L-328 Flat or L-327 Semi-Flat is used as the final finishing coat.—201

Waterproof Synthetic Undercoat—Helps produce a smooth finish on such porous woods as basswood, cypress and poplar. Has unique filling properties and build. Because of its superior holding out qualities it often eliminates one top coat, or results in a distinctly better looking finish without extra operations.

Soaking in water, even with the back edges of the wood uncoated, will not loosen the bond between this undercoat and the surface. It has exceptional toughness and permanent adhesion. May be sanded and recoated with either enamel or lacquer in two hours, and its speed of drying, together with these other unusual characteristics, indicate its usefulness to manufacturers of Venetian blinds, toilet seats, wood caskets, novelty furniture, kitchen cabinets, handles and many other products.—132

Duraflex Venetian Blind Enamels—Supplied in both lacquer and synthetic types for spray or rollercoat application. They provide durability, adhesion and flexibility, which are the primary requisites of the perfect Venetian blind finish.—102

Tech Special Bleach—Recently developed; has met the needs of refinishers having stubborn stains to remove.—108

Tech Varnish Remover—Has been improved and is being used to remove enamel from dinette sets, etc., and in most cases is very successful. —109

Crack-A-Jack Polish—A furniture polish that is used for cleaning up work; does not settle and is not injurious to the hands; has pleasing odor.—125

Non-Bloom Rubbing Oil—For clean-up and rubbing work. Does not bloom.—126.

Non-Checking Clear Lacquer—A well balanced rubbing lacquer for furniture and radio cabinets, having unusually high resistance to cold checking, alcohol and heat. In repeated tests this lacquer (two coats over sanding sealer) has stood 50 cycles of alternating 30 minute periods of 120°F. and —5°F.—131

Duraflex Venetian Blind Primer—For spray application; dries hard enough to sand or recoat with lac-

quer or synthetic enamel in 10 minutes. Due to the unusual characteristics of this primer, it has excellent sealing qualities so that the finishing coats are held out to the maximum extent. This primer also available for rollercoat application.—196

Mac's 18th Century Finish—A popular finish on mahogany that has proved itself. Finished panels on request.—124

Marpolac — A clear finishing coat which is of more than ordinary interest at the present time because of the possibility that scarcity of wood oil will make the price of oil varnishes prohibitive. Marpolac is extremely durable, owing its long life to the use of a new type of gun which has recently been developed. It has the quality of lying up on the surface, producing about the body of an average coat of oil varnish. Two coats of Marpolac applied directly over stain produce a very attractive finish. The film dries quickly enough for two coats to be applied in one day. Its covering capacity is considerably greater than that of nitrocellulose lacquers and approaches that of oil varnishes. The pleasing luster may be left natural or steelwooled and waxed to produce a beautiful flat finish.

While Marpolac is so priced that it may be used on the lowest priced lines, its quality is so high that it may be used appropriately on the best grades of furniture as well. Marpolac will not crack or craze with age. The film has a tendency to shed dust and grime. It has a pleasantly smooth "feel" and cleans up to its original appearance, even after long wear.—160

Triplex Stains — Combine several qualities which make them extremely desirable from the standpoint of high grade finishes, economically secured. Up to the present time, in securing a finish which has a warm undertone on solid wood, it has been customary to apply a toner or base color, then seal and sand, and then

When I was in North Carolina and Virginia, late in November, the outstanding impression I received from that section was that only the manufacturers of cheap furniture are busy. A very large amount of maple is being used. It is largely employed by two different types of manufacturers. One makes good-looking, solid maple furniture such as living room or porch furniture. While this furniture is low priced, it is just about as nice as it can be made. The other type of furniture manufacturer who uses maple produces case goods, desks, etc., and the construction is rather flimsy. In such plants, quick production is stressed and good lacquer finishes are largely used.—Finish Manufacturer.

apply a glaze which was wiped out and blended to secure some degree of uniformity. Aside from the fact that such glazes have not been strictly compatible with lacquer applied over them, when a sufficiently high degree of uniformity was secured, the finish was likely to present a "painty" appearance.

In one application Triplex Stains produce a rich background color, together with a high degree of uniformity. The uniformity is not at the expense of clearness but brings out the desirable features of the grain. Some degree of filling is produced at the same time, which is reflected in additional body in the completed finish without additional coats being applied. Triplex Stains may be applied by spray, dip or brush. After wiping to highlight the stain, the sealer coat may be applied immediately if desired.

The ingredients of Triplex Stain have no injurious after effects on the succeeding coats of finishing materials. Triplex knits in with lacquer or varnish coats, insuring a homogenous film from the top surface down to the wood.

Triplex is available in all desired colors, from very light shades, such as Swedish Modern, to deep red mahogany. Noted for their clearness and brightness of color, easy-working qualities, and economy of application.—159

Piano Lacquer — This brilliantly clear-toned lacquer is made expressly for schedules commonly followed in the piano and fine furniture industries. Because it contains 27% solids at spraying consistency, it provides the maximum in build and depth with fewest coats. Excellent resistance to cold checking is an indication of the long life expectancy of this piano lacquer. It meets the most exacting requirements in rubbing, polishing and print-resistance, and retains its full plumpness without shrinking.—134

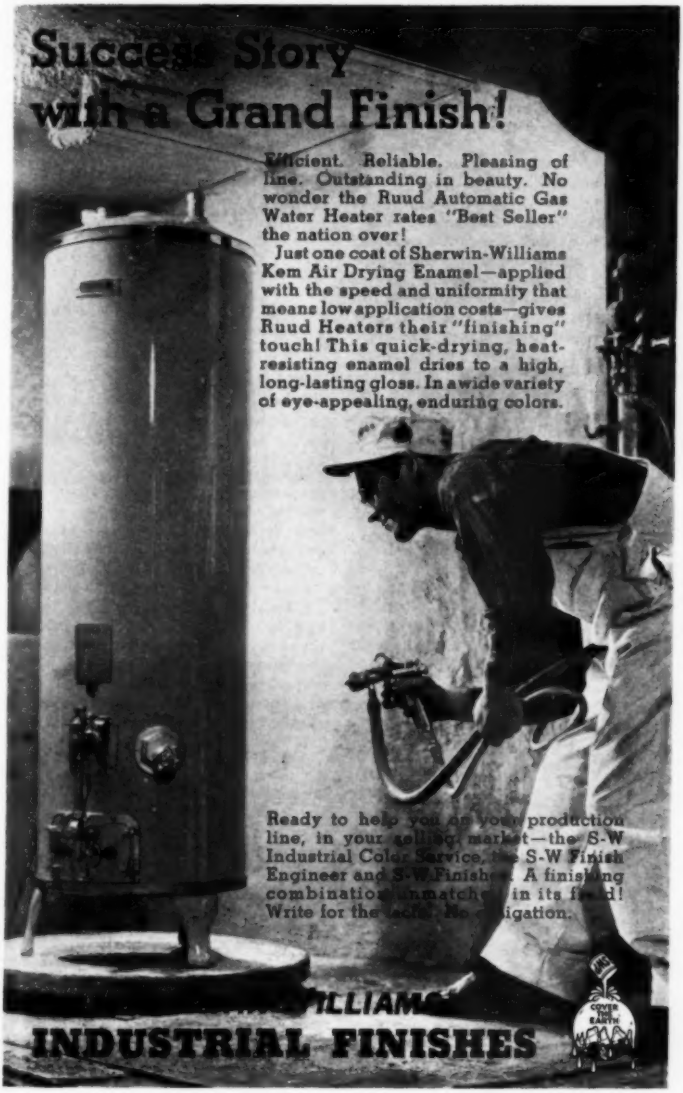
Clear Sanding Sealer (A379)—Has a high build. A high viscosity material that dries in 20 minutes and is ready for sanding and recoating immediately. May be used successfully on furniture, wood novelties, etc. Holds succeeding coats without sinking.—151

Mixing Lacquer—For use with shellac. Makes shellac harder yet more flexible, and provides for greater compatibility with succeeding lacquer coats. Costs no more than shellac. —152

Quick Sanding White Undercoat No. 7511—For use under lacquer, synthetic or varnish; white, ivory and pastel colors. Sands quickly and easily and gives much better build and coverage than a sealer, as well as being much more flexible and tough; also very inexpensive.—153

Non-Sanding Clear Wood Sealer No. 7778—For use where wood is well sanded. A labor and cost saving item on inexpensive work.—156

Pigmented Oil Wiping Stains—Furnished in all popular shades of ma-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Efficient. Reliable. Pleasing of line. Outstanding in beauty. No wonder the Ruud Automatic Gas Water Heater rates "Best Seller" the nation over!
Just one coat of Sherwin-Williams Kem Air Drying Enamel—applied with the speed and uniformity that means low application costs—gives Ruud Heaters their "finishing" touch! This quick-drying, heat-resisting enamel dries to a high, long-lasting gloss. In a wide variety of eye-appealing, enduring colors.
Ready to help you on your production line, in your selling market—the S-W Industrial Color Service, the S-W Finish Engineer and S-W Finishes. A finishing combination unmatched in its field! Write for the facts. No obligation.
INDUSTRIAL FINISHES

ple, walnut and magohany; do not settle hard in containers or dip tanks; are easily uniformed; contain no poisonous benzol; produces a remarkably clean, clear stain on the wood, when sprayed, dipped, brushed or poured.—157

"Staynfil"—A new 2-purpose furniture finishing material, embodying the properties of both stain and filler. Specifically made for more effectively attaining a high quality color base in the reproduction of old European furniture finishes. Available for both mahogany and walnut woods. Put up in paste form and handled in the same manner as regular wood filler.—137

Air-Dry Synthetic Enamels (B. S. Types)—These synthetic enamels air-dry and are dust-free in five minutes; can be handled in 20 minutes and will be absolutely hard overnight. An excellent one-coat finish for refrigerators, nursery furniture and wood novelties.—140

Padding Lacquer—A clear-base product to be applied with a pad over finished furniture that is scratched, marred or marked during handling or while in transit. Padding lacquer is not a polish but builds a film on the old finish by a hand-padding operation. This finish dries within ten minutes after application and can be steelwooled immediately thereafter. A most unique product for manufacturers of furniture; also warehouses and department stores that refinish furniture by hand methods.—142.

Metalized Undercoats—Afford a very fast-drying and smoothly finished product. Metalized undercoats give splendid mileage in an inexpensive finish, with either spray or roller coating equipment, on Venetian blinds, kitchen cabinets and other wood specialties.—150

Wood Bleach—Low-priced. Consists of only one liquid instead of the usual two, thus simplifying its use; seems to be as effective as any.—181

Veneertite—A scientifically correct preparation for the treatment of crotch, swirl, butt and other shaky-texture veneers to prevent checking, cracking and blistering. Perfect results are assured and the effect is permanent. Veneertite is easily applied to the raw veneer with brush, spray or by dipping; then veneer laying is done in the usual manner. The preparation can also be applied to other veneers in place of glue-size, after veneers are laid. Veneers thus treated stay put.—182

Dri-Dark Rubbing Compound—Dries dark and does not show white in routings, carvings or corners; has an exceptionally fine sharp cutting abrasive—a cleaning solvent and a wax content.—183

Wateroil Stains—Real water anilines dissolved in an oil base, fast to light—non-bleeding, quick-drying, non-grain-raising; do not change color with age, and can be shipped and stored in metal drums indefinitely without deteriorating or changing in any way.—184

Pure Refined Shellac, No. 101—Clear; wax free; beautiful gloss-fin-

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We have seen the advent of some very fine strictly non-coloring lacquer which fills the demand of those of our customers who are bleaching their wood products, and do not want to lose a number of shades away from white by using lacquers or varnishes not particularly adapted to preserving the very light or white color of the wood which has been completely treated. We do not make lacquer, but we recognize the progressiveness of the lacquer manufacturers who appreciate our accomplishment in the way of producing lighter than natural wood color before the finishing material is applied.—Bleach Mfr.

I see a slight tendency in our furniture finishing to use more shellac, but we still are using a high grade sealer on most of our work.—Furn. Mfr.

ishing coat; also waterproof; can be reduced for spraying by adding one gallon of alcohol to one gallon of shellac as shipped. Or, to apply by brush, reduce 33⅓% with alcohol.—191

Pure Semi-Refined Shellac Coater, No. 102—Opaque, contains 1½% wax when thinned down ready for use.—192

Pure Semi-Refined Shellac Sanding Coater, No. 104—You can thin this down, using one gallon of coater, which produces 1¾ to 2-lb. body ready for spraying; dries in 10 minutes and is ready for sanding in 20 minutes.—193

"Kwik Koting Primercoat" — For metal or wood. Air-dries to recoat in 5 minutes, or to sand and recoat in 10 to 15 minutes. Reduces with low-priced lacquer thinner or special reducer. Comes in natural for all-over sealer coat under colored lacquers or for blond finishes, and in walnut, mahogany and black for specific color needs. Light oak and similar shades may be had if desired. Unit cost of production is very low because of the high solids and speed of drying. Material comes with 100% more solids than ordinary lacquer sealers.—165

"Kwik Koting Edgesealer" — For priming and preparing veneer edges and end-grain surfaces. Can be recoated with stains, fillers, shading lacquers, etc., immediately after application. May be applied by brushing or spraying; comes in natural for blond finishes and all shades for under stain filler.—166

"Kwik Koting Pigment Stain"—All popular shades in permanent, non-bleeding colors. Will not precipitate or settle when reduced with petroleum naphtha in the proportion of one part of stain to 3 or 4 parts of naphtha. May be recoated in one hour if desired. Adds to the adhesion of the completed finish. Can be used for uniforming sap streaks before filling if sprayed or wiped on just before filling the panels.—167

Soft-Wood Finish — A synthetic one-coat gloss or semi-gloss finish for soft or porous woods (also may be used on hardwoods). Can be sprayed, brushed or dipped. Air-dries to pack overnight; comes in clear and in transparent shades of maple, walnut and mahogany.—168

"Wax-N-Kloth"—For polishing and dusting before packing and after unpacking.—169

Absolute Stain Solvent — A clear water-white solvent which dissolves water-soluble acid anilines. Colors go into the solution immediately and when the resultant stain mixture is applied, a clear uniform shade is obtained with a total absence of grain raising. It may be recoated within 30 minutes after application.—162

Rub-less Lacquer — (Less rubbing required.) A new rub-less lacquer (licensed) which is transparent, tough, heavy-bodied, resistant to alcohol and unusually check-proof. According to the manufacturer's literature:

"By eliminating the least expensive solvent used in making all regular lacquers and replacing it with a superior and more costly one, we have produced the new rub-less lacquer. Because it positively does flow

We hope not to seem stagnant from the fact that we have simply very carefully watched our formulas and processes to be sure we merit the fine lot of business we are getting continuously on a workable, safe, efficient bleaching medium.—Bleach Mfr.

out more smoothly, and dry without microscopic 'hills and valleys', it can be rubbed with less than half the regular effort, and at the same time leave approximately 50% more lacquer on the surface after being rubbed."—179

Knit-Tite Rubbing and Polishing Varnish—A combination of bakelite resin and some select hard-fossil gums which produce a great deal of the brilliance of the old fashioned varnishes. The incorporation of synthetic resin gives the film its unusual toughness, hard-drying properties overnight, and resistance to the action of liquors and perfumes, as well as cleaners, strong soaps and alkalis.

Considerable progress has been made in the study of correct air pressure and fluid pressures for satisfactory and economical results in spraying.

This type of varnish contains a large percentage of solid substance which remains on the surface to which it is applied. However, it retains the free-flowing properties so essential to proper application. On actual tests the unusual covering capacity of this material has been proved under production conditions. Furniture manufacturers have shown a great deal of interest in the use of this material because of its decided sales appeal, not only to dealers but to the ultimate consumer. The varnish is particularly suited for table tops, buffet tops, coffee tables and service units.—203

Super Lacquer—Lacquers produced under the existing patents; contain 27% solids; made both in gloss and satin finished effect. To complete the line . . . . a 27% solid Super Sealer to be applied before the finishing coats.

The high solid content and deep full body of Super Lacquers on the work produce a splendid finish with one coat over the reduced Super Sealer. However, to get a deep varnish-like finish some concerns are using two coats of the finishing lacquer. The Super Lacquers are alcohol resistant and are much tougher than the usual lacquers supplied for wood finishes.—209

Lacquer Sanding Sealer (S-1202)—High-solids non-royalty sealer; sands easily without clogging; good filling and building properties; reduces sanding operations.—197

Rubbing and Polishing Gloss Lacquer (W-1001) — Non-royalty but equal in total solids to most royalty lacquers. Pale color, good flow and heavy body. Most economical in finishing high grade furniture.—198

Flat Wood Lacquer (F-1601)—Non-royalty satin finish lacquer; will not show haze; produces a hard-surface film which will not mar.—199

"WDS" Wood Dye Stain Solvent—Developed specifically for use in the preparation of non-grain raising, non-bleeding and fast-drying wood stains. It has high solvency for the water-soluble, as well as the spirit-soluble acid and direct dyes employed in the staining and graining of wood. "WDS" Wood Dye Stain Solvent penetrates deeply and uniformly and gives clear, transparent effects.—194

Paper, Fabric, Leather, Rubber

Some remarkable progress has been made in the development and improvement of satisfactory finishing materials for sheet stock and products made of paper, fabric, leather, rubber and various types of composition materials. In some cases the finishing material is applied to the moving sheets by spraying, flow coating or roller coating. Otherwise, the completed products made of these materials are finished in any one of the usual production methods such as dipping or spraying.

Lacquer emulsion coatings, especially adapted for use on porous surfaces, have met with great favor. These emulsions, involving cellulose nitrate and other cellulose compounds are recent introductions to industry. The manner of application is by spray, dip or roller coating and the resultant film deposit is much greater than the orthodox lacquer coatings applied in the same manner. The stability factor is rapidly becoming overcome and with chemical investigation it is expected that comparable stability to similar coatings will be attained. These emulsion coatings are used on paper, pulp and similarly porous surfaces. However, they lend themselves to use in the automotive and metal coating industry as pigmented emulsions. Selectivity of raw materials and extreme care in manufacture is essential to exacting results.

Textile Printing Lacquers—Suitable for application by the copper-engraved rollercoat printing machine are now used with very satisfactory results. They provide excellent adhesion on natural silk, cotton, rayon and acetate silk; excellent flexibility together with solid coverage in all colors.—103

Printing Lacquers—Supplied for use on oiled silk and pliofilm. These printing lacquers permit the application of attractive designs on paraffin-coated oiled silk which is at present the popular vogue for shower curtains, raincoats, umbrellas and other purposes.—104

Pliofilm Printing Lacquers—Developed for use on Pliofilm, the new type of transparent flexible rubber film which is used for shower curtains, raincoats, umbrellas and package wrappings. Excellent adhesion to the pliofilm is secured because of the close bond between the Pliofilm printing lacquer and the Pliofilm itself. This provides more satisfactory printing materials than the old type of products which were poor in adhesion and flexibility.—105

Scutar—A new synthetic finish for manufacturers of imitation leather, paper and various rubber goods; made in all colors and clear; contains 40% solids; is applied by spreader or gun and dries to a bone dry, tough, hard, high-gloss finish in 5 to 7 minutes. It is supposed to have very low penetration and yet great adhesion. Scutar resists water or inorganic acids, alkalis, alcohol and many organic acids such as acetic, cytric, oxalic, etc. It retains its flexibility under almost all conditions. —110

Sole Bottom Lacquer—A new lacquer for finishing the bottoms of shoe soles, which takes the place of water paint and eliminates the need for buffing the soles prior to application, as it covers rough surfaces with a smooth, durable coating. . . . Is supplied in clear and in black, and in dull, medium and high gloss; is applied by spraying and dries very rapidly in the air. One gallon, it is said, will cover more than 1,000 pairs of shoes.—120

Texto-Lacs — Finishes for textiles such as rayon, cotton fabrics, silks, silk ribbons, and for general decorative silk purposes. The clear lacquers or enamels are applied either by spray or machine-coating operations and are extremely flexible materials that supplant the ordinary dye coloring methods of imparting designs on fabrics.—146

Synthetic Paper Coating — High-gloss, moisture-proof coating for labels. Made especially for packages that are wrapped and sealed while hot (200° to 250°F.). Mileage same as regular label varnish ready for use. Film is permanently flexible and is not thermoplastic. Also designed

for high speed machine wrapping and packing. Final film is grease proof and odorless and may be used on any food wrapper where residue odor could not be tolerated.—170

Bronze Paper Coating Lacquer—A brilliant smooth finish with natural slip of uncoated paper. It is flexible and tough; will not jell with gold bronze.—171

Printing Lacquer for Cellophane—Lacquer inks in all colors, providing exceptional adhesion, gloss, flexibility and opacity. Carefully adjusted solvents to meet the drying speed so necessary in cellophane printing.—172

Finish for Rubber Goods—Synthetic varnish applied to rubbers or overshoes before cure (live steam or dry heat). An elastic finish, having excellent adhesion, flexibility and the ability to heal after stretching to the maximum and not mar the finish. Its resistance to wear and marring are exceptional. Supplied in clear gloss, eggshell, and colors.—173

Metal Finish for Rubber—It is often desired to give the rubber parts or products a metallic finish that will harmonize with the metals with which they will be used. To make this possible, a special bronze lacquer for rubber has been developed. This special rubber lacquer makes it possible to cover semi-stiff rubber with a strongly adherent, durable finish resembling brass, copper, bronze, aluminum, steel, or other metals. It consists of a special bronzing liquid to which metal powder of any kind is added just prior to use. The mixture is applied by spraying, and air-dries rapidly.—190

"Before-Cure" Rubber Enamel—Used on rubbers, overshoes, rubber boots, or with a continuous curing system for yard goods. Complete hiding with one coat. Higher gloss than can be obtained from lacquer. The adhesion and flexibility are excellent.—175

The one undertaking which has been outstanding with us for the past year has been "finishing-material standardization"; that is, to reduce to the lowest possible number the paint materials purchased in our various plants. This practice has enabled us to produce more uniform finished work at tremendous savings over our previous practice.

Another highlight of the past year was the development and use of our new viscosimeter which has put an entirely new light on factory control methods of paint materials.—Mfr. of Electrical Machinery.

Special Sealer for Rubber—Effectively seals black rubber so that top coats of white lacquer will not yellow.—176

Canvas Dope No. 1310—This is a quick-drying material and it has exceptional value in waterproofing and shrinking of canvas fabrics used in making of Kyaks, canoes, etc.—177

Miscellaneous

Here are listed items that do not exactly fit into any of the other classifications, yet they are important and very useful to modern industry.

Alkali-Resistant Lacquer—After a full week's immersion in a 2% soap solution, kept at 125° to 140°F., the film of this air-dry lacquer is still intact. It retains its adhesion, gloss and flexibility under this severe exposure in a degree hitherto considered impossible with finishes of this type. Suited to fast production, this flexible finish may be loosely wrapped with paper 20 minutes after application without injury.—133

Outline Black Lacquer—For silk-screen process work. Outline Black Lacquer provides for outline work on

silk-screen operations. Sharp outlines can be made with this material which is an extremely desirable feature in this class of work.—144

Silk-Screen Lacquers, Enamels—A fill in clear. This product is used in silk-screen printing to block out that part of the design which is not to be colored.—145

Colors Transparent Composition Sheets—Durable fast-to-light transparent color finishes for such transparent composition materials as Luminol, Cellophane, Katapak, etc., wherein lights are to shine through the materials, as in lamp shades, colored light effects and window displays. The material is applied by any of the common methods and allowed to dry overnight.—164

Special Finish for Quaterlining—Consists of 1) Primer No. S-1041 or No. 6, which improves the adhesion of lacquer to stock; and 2) Gloss Lacquer No. S-1088. This finishing system produces a high gloss film with remarkable adhesion and flexibility, yet the film is hard and tough. —174

Speedy Wax—A new liquid preparation, which cleans and waxes a car finish in one operation. One of the most useful applications of the new wax is in getting new and refinished cars ready for delivery; cleaning and waxing can be done simultaneously and quickly. It works equally well on all colors, and also is suitable for all types of lacquer or synthetic enamel finishes. The wax is useful on old cars as well as new and on the older finishes as well as the modern.—178

One item of interest during the year has been our work with high heat-resisting aluminum paints. Our work on this item to date shows that coatings are available that will withstand temperatures as high as 1700°F.—Mchry. Mfr.

Blue Streak Remover—(Paint and varnish remover.) Contains no paraffine wax or other products which will in any way affect the drying of subsequent finish coats, even though the surface has not been cleaned. This remover can be mixed with lacquers without in any way affecting their drying qualities. Ordinarily, paraffine is used to prevent rapid evaporation of solvents. The ingredient used as a substitute for paraffine seems to retard evaporation of remover solvents even more than does paraffine wax. Yet, in spite of this fact, it has no effect whatsoever on the drying of lacquers, sealers, synthetics, shellac or any other finish applied to a removed surface.—180

In decorative finishing there is an increased use of colored flock which can be sprayed on prepared surfaces in solid, mixed and mottled colors in various artistic designs laid out by stencils. By a "prepared surface" we mean one that has been first coated with a durable and effective adhesive such as lacquer, quick-drying varnish or shellac. When this coating becomes tacky the flock is sprayed on, usually by a special cup gun designed for spraying flock. All kinds of fabrics and flexible materials can be covered, as well as the more familiar solid surfaces such as wood, metal or composition materials.

Flock, as probably most readers know, is short cut-to-length fibers of cotton or rayon or silk. When thickly sprayed over an area, and after the excess flock has been blown away, the surface presents an attractive suede-like appearance that is quite effective where this kind of finish is desirable.

We have some other new and seemingly very valuable contributions to the Finishing World, but until we ourselves are satisfied that we can actually deliver laboratory perfection to distributors, and large consumers we feel in duty bound not to announce them. I dare say you approve of our attitude. —Finish Mfr.

Lithosol Scarlet 2YL—A new scarlet color for use in lacquers; has a deep masstone and yellow tint, and, when used as a strontium toner, closely resembles Scarlet 2R for Lakes in shade. The barium toner is much lighter in masstone and yellower in shade than the strontium type, whereas the calcium salt is very blue in shade and slightly yellower in masstone. Tests demonstrated a good resistance to light. The new dye is also non-bleeding in oil, water or alcohol and is unaffected by acids, alkalis or baking.—205

Lithosol Fast Yellow HL Powder—A new color that is expected to find use in water paints and lacquers. It is a lake color yielding bright, medium shades of yellow, slightly greener and brighter in shade and a little darker in masstone than Lithosol Fast Yellow HN Powder, to which it is chemically related. The new color has exhibited good tinctorial strength and working properties and fastness to light, acid and alkali. Fast Yellow HL Powder is a pigment which does not require a precipitating agent when mixed or thrown on bases.—206

Automotive "Pyralux" Finish — A nitrocellulose product especially developed to meet a specific need by combining certain features of lacquer and synthetic resin enamels. It has a high initial gloss, with good build and flow-out, and dries with speed approximating that of lacquer. Its chalking rate is comparable to that of a refrigerator enamel, thus making it a satisfactory finish for touching up synthetic enamels and for complete repainting of used cars. Automotive "Pyralux" is available in black and 26 popular shades.—195

Acknowledgment—The Editor wishes to acknowledge that some of the "copy" for these introductory paragraphs and for the inserted editorials appearing among the new materials listed in this article, was supplied through courtesy of these gentlemen:

J. M. Alexander, Purchasing Agent.....
Tennessee Furniture Corp.
H. R. Anderson, Secretary.....
James B. Day & Co.
H. J. Boll, American Mach. & Fdry. Co.
W. H. Cosh, Manager of Sales.....
Larkin Co., Inc.
V. J. Dolan, President.....
V. J. Dolan & Co.
Gustave Klinkenstein, V.P. & Tech. Dr.
Maas & Waldstein Co.
J. A. Ledwith.....
Woodfinishing Products Co.
Ray C. Martin, Chemist; The Arco Co.
L. R. Van Allen, President.....
L. R. Van Allen Co.
G. B. Work, Sales Promotion.....
The Glidden Co.
E. A. Zahn.....General Electric Co.

"Dulux" White Enamel—An improved "Dulux" White Enamel has been developed that will bake in half the time of previous high-bake white enamels. Its advantages are: Improved hardness, better adhesion to undercoat, less yellowing in the dark, less bleaching, better grease resistance and better stain resistance.—216

NOTE: Review items received too late for classification in this section will be found on page 90.

CHEMICAL ENGINEER SUMMARIZES A TEN-YEAR EXPERIENCE IN

Painting Storage Battery Containers — III

by Alvin Fuhrmann
Chemical Engineer
National Battery Co.
American Container Div.

This final installment of Mr. Fuhrmann's article takes up pigments and solvents of finishing materials used in the painting of storage battery containers; also equipment and methods of application and author's conclusions.

A VARIETY of color is often demanded in the finishing of any article, but when the problem is limited to container application it is advisable to use only those colors that have acid-resistant qualities. Inorganic, chemically pure pigments have been found superior to organic chemical colors for this work. Disregard of these facts in order to obtain some particular shade of color will only result in an inferior coating. Aside from this need of careful selection, it should be emphasized that the biggest problem of the chemical color industry, due to processing difficulties, rests in the production of successive batches of a given color that will be alike in all properties.

The most important inorganic colors that have been found acceptable for container application are listed as follows:

1) **Black**—By far the most inert and acid-resistant color when pigmentation is limited to carbon black.

2) **White** — The most acid-resistant pigment available to date is titantium dioxide. This pigment also has excellent covering power.

3) **Red**—A color which possesses definite sales appeal and consequently is in great demand. Numerous pigments are available but best results have been obtained with cadmium reds.

4) **Blue**—Not a satisfactory color unless selection is limited to the darker shades imparted by iron blues.

5) **Yellow**—Another difficult color, but carefully selected lead chromates will provide fairly good results.

6) **Green**—One of the most satisfactory acid-resistant colors when selection is confined to chromic oxide. This material, however, lacks brilliance and has low tinting power.

7) **Bronze Powders** — Metallic

bronze powders are often used to obtain distinctive finishes but acid resistance has always been a problem. Aluminum bronze is obtained from pure aluminum ingots, while gold bronzes are derived from copper with a small amount of zinc. In producing bronze powders, the metal is hammered to a fine flake size in a stamp mill, then sifted and air separated to desired mesh. The powder at this state is very dull.

Suitable luster is obtained by coating the powder particles with a film of stearic acid in a brushing machine. Colored bronzes are produced by treating the bronze powder base with aniline dyes. Aluminum powder is now available in an extremely fine mesh and is mixed in paste form with high-boiling petroleum fractions for convenience in handling. This finer powder has a smoother finish, greater covering power and is free from coarse grains.

No bronze powder is acid resistant, consequently the entire load is placed on the vehicle. In addition to this, the mixed material should not stand over a period of three to six hours, as the solvents used with the vehicle tend to dissolve the polishing agent and thus destroy all trace of luster.

In applying bronze powder finishes, proper directions for mixing and application must be rigidly observed. In order to obtain any lasting quality of acid resistance it is also essential that the bronze coating be given an additional clear varnish protective top coat. This step, however, has a tendency to mask the bright metallic luster due to the amber color and highly reflective surface of the varnish.

After consideration of these various requirements for pigments in a finishing material there is the next problem of selection of correct solvents.

Selection of Solvents

It is often necessary to add solvents or reducers to a formulated finishing material in order to obtain proper application. In the case of pigmented phenol-aldehyde varnishes of high solid content, solvent use is essential. In this selection there are several important points to consider.

1) Solvency or reducing efficiency; 2) Evaporation rate; and 3) Cost.

The type of solvent is dependent upon the vehicle base, but in all cases proper solvency is necessary. Drying characteristics can be varied by using a solvent having the proper evaporation rate.

Usually, it is customary to purchase reducers from the supplier of the finishing material, but in the rapid spread of synthetics this problem has been simplified and considerable saving can be effected by purchasing the proper materials direct from the solvent producer.

The various types of solvents used are classified as follows:

1. Aliphatic Chain Esters—Solvents of this type are required for all cellulosic-base finishes. Ethyl acetate is a typical example. Due to the exacting requirements of evaporation rates, solvents used with cellulose-base lacquers are generally complex mixtures, and it is advisable to purchase reducers for this class of work from the lacquer manufacturer.

2) Coal Tar Hydrocarbons—Toluol, xylol and solvent naphtha are the members of this group,

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all of which are usually excellent solvents for synthetic base finishes.

3) **Turpentine** — Occasionally a synthetic base may require improved flow characteristics and slower drying time. A small content of turpentine with a coal tar hydrocarbon is often the answer. This applies particularly to alkyd-base finishes.

4) **Petroleum Hydrocarbons** — Due to research and new processes of manufacture, this group is rapidly becoming more important in solvent use with synthetic materials. A number of excellent petroleum naphthas are produced by fractionation, cracking or polymerization methods, but due to low solvency they have been used chiefly as diluents with materials of higher solvent power.

However, there are recent petroleum products produced by hydrogenation and solvent extraction methods which have a solvency approaching that of coal tar hydrocarbons. They also possess lower toxicity and better wetting qualities. These new materials are meeting with general acceptance as solvents for synthetic finishes since application is often improved and costs reduced.

This concludes the outline pertaining to ingredients required in a satisfactory container finishing material. There remains only the selection of proper equipment, without which no painting operation can be entirely successful.

Equipment for Product Painting

Due to variations in container design several methods of application are used, each of which requires specific items of equipment.

1) **Spraying** — In spray work the first requirement is sufficient air compressor capacity. It is usually advisable in intermittent work to use automatic start-and-stop control. The air receiver should be large enough to provide equal periods of compressor rest and operation. An air line filter should be installed in the line close to the point of work to insure elimination of water, oil and dust particles. The new type porous stone filters give excellent results. If it is necessary to remove water vapor, an after-cooler should be used in connection with the filter. Since regulation of air pressure is also important a suitable pressure regulator providing close control, with minimum pressure drop, should also be installed at the point of the spray operation.

The rapid development and use of synthetics soon made necessary improvements in spray gun design. These heavier, more viscous materials demanded an increased ratio of air flow to flow of material in order to obtain complete atomization. This was accomplished by improving the air cap design and providing larger air passages through the gun. Older type guns used 7 to 8-c.f.m. while the new types require 15 to 25-c.f.m. The final correct air and fluid gun adjustments for any given material can only be determined by actual experience. This applies whether the fluid is supplied to the gun by suction cup, gravity flow or pressure feed.

2) **Roller Coating**—The majority of container nameplates are molded in relief. Hand roller coating has been found to be the best method of application. The diameter and width of roller is dependent upon medallion design. The container area not to be coat-

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ed is covered with a shield blanked to accurately fit the relief section. Old type gelatin rollers are not satisfactory. The composition of the roller should be based on solvent resistant plastics such as Neoprene or Thiokol compounded and cured to proper degree of hardness in order to obtain best results. This is important since high-boiling solvents are used in roller coating application to prevent sticking or stringing which often develop with too rapid drying.

3) **Striping** — Occasionally the design calls for a horizontal ribbon of color extending around the container. Of the various styles of flow or striping guns used for this work, the knurled wheel type has been found most satisfactory. The width of stripe is governed by width of wheel.

Final Conclusions

Although considerable improvement has been made in recent years in the formulation of finishing materials designed to meet specific needs, the perfect acid-resistant film for container application has not yet been developed.

Because this improvement is a never ceasing process it is necessary to constantly search for the best currently available product. The great detail to which a search of this kind can lead can be simplified by obtaining a reliable, progressive source of supply, preferably a manufacturer specializing in industrial synthetic finishes.

Considerable work is now being done, aimed at the utilization of methyl-methacrylate, urea-formaldehyde, rubber derivative and styrol resins as vehicles for synthetic finishes. It is only reasonable to assume that the quality of finishes which must meet severe service conditions will be definitely improved.

Unfortunately, the production of finishes of this type often presents complex problems and because the volume involved in container application is relatively small, the burden of assuming the initiative in requesting samples of new materials rests with the customer.

In the selection of any color, it should again be emphasized that only those shades imparted by relatively acid-resistant pigments should be considered.

Finally, the most important problem in the selection of a container finishing material lies in obtaining the correct relationship of the critical factors of acid resistance, adhesion, ease of application, drying time and gloss. A material qualifying in one or several points is no insurance against ultimate failure unless the remaining characteristics are in proper balance.

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The Rudd Lacquer & Sealer Corp. of New York have announced the appointment of Mr. Raymond Moore as their Southern Sales Manager. Mr. Moore will be located at 206 Guilford Ave., High Point, N. C., and will continue to serve the Southern furniture industry.

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An interesting bulletin which gives practical information about the mechanical and chemical cleaning of metal surfaces for the application of decorative and protective coatings, has been compiled, published and made ready for distribution by the Hilo Varnish Corp., 44 Stewart Ave., Brooklyn, N. Y. A copy of this Methods Bulletin should be in every metal cleaning and finishing department.

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Painting Fir to Kill Grain

Referring to "A. Q. Co's." question (published in November issue, page 55) about painting fir plywood to get a really smooth surface, in the first place you must have the surface sanded reasonably smooth in the white—that is in the bare wood. I would suggest at least a 3-coat paint job; four coats would be better.

The first coat can be a surfacer, sealer or shellac. This should be sprayed on evenly and moderately thin. When thoroughly dry, sand the surface smooth. The second coat should be a suitable undercoat—followed by sanding when dry. The last coat can be a straight lacquer or a synthetic enamel or oil enamel—or a half and half mixture of the undercoat and enamel. The latter, of course, would give less gloss.—J. K. COOPER.

Finishing Brass

In this article I wish to answer a problem that was presented in the November issue of INDUSTRIAL FINISHING, (page 11) on "Finishing Brass." The problem presents itself to me as: "How to improve the present process of bright dipping brass." The following is a formula for bright dipping brass:

Sulphuric acid	(gal.) 2
Nitric acid	(gal.) 1
Water	(pint) 1

Send in your problems and questions. Every finishing department has them. Well informed men are eager to help you — through Industrial Finishing. Also, if you have any more comments, or suggestions to add to the replies published here, please send them in. An exchange of ideas helps us all.

Questions Answers

Add 1-oz. of table salt to each five gallons of dip solution to improve the brightness of the work.

The dip should be allowed to cool properly before being used. Once the dip is made, water should not be added any more on replenishing it, since the work dipped always carries some water along with it. On the other hand if the shape and recesses of the work causes too much water to be carried into the dip, the results will be immediately noticed by the dullness of the dipped work.

There are a few other factors to consider outside of the formula. The following is an outline of the procedure of the average brass dipping job:

1) Hot potash cleaner rinse (to remove grease or oil film); then cold water rinse.

2) Immerse in acid dip for a few seconds; then quickly rinse in running cold water. The timing of this procedure is according to the strength of the dip. If the articles dipped seem to bunch together they should be shaken during this operation.

3) Cyanide rinse and cold water rinse to remove possible tarnish. The cyanide rinse is made of 2-oz. of sodium cyanide to each gallon of water.

4) A soap water rinse made of ½-oz. soap flakes to each gallon of water.

5) Hot water rinse and allow

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to dry in hard maplewood sawdust.

If the work is to be lacquered it can be rinsed in a water-white lacquer immediately after the hot water rinse, thereby eliminating sawdust drying. This depends on the size of the articles.

There is a satin finish on the brass that can be produced without bright-dipping the work. This finish is produced with a Lea compound. The composition is applied to a loose-leaf buff revolving on a lathe at about 1800-r.p.m. The articles are dry when buffed with this material. To preserve the brushed brass effect, the work would have to be lacquered after finishing. — MEYER ROTER (Foreman Plater and Finisher).

Kills Lacquer Fumes by "Scorching"

Before telling about an interesting solution to a problem that many experts say "can't be done," I shall repeat a question published back in November 1937 issue. A man signing himself as "S. H. F." says:

"I do occasional lacquer spraying on the ground floor of a 6-story building, and the exhaust from the booth is vented into an air shaft. The tenants of the apartments in the building complain of the odor, but unfortunately it is not permissible to erect a flue to the roof. Do you know of any means or method whereby the lacquer odor can in some way be filtered or otherwise neutralized? Any suggestion

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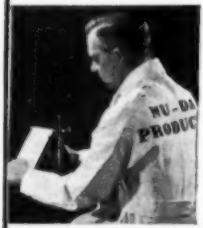

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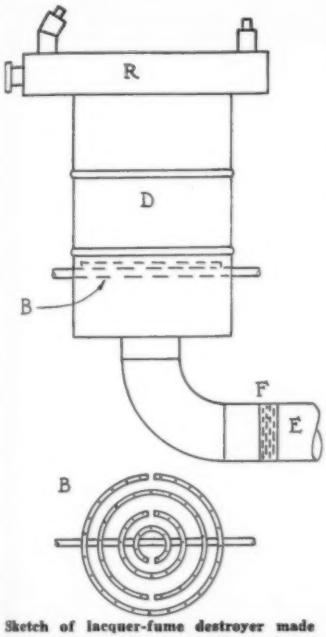

Sketch of lacquer-fume destroyer made of an oil drum "D," automotive radiator "R," special circular gas burner "B," and a removable wire mesh filter "F" placed in spray booth exhaust pipe "E."

you might make will be greatly appreciated."

I wonder if S. H. F. is so situated as to try burning out the objectionable elements in the exhaust from his spray booth? If he has enough room for the setup, I believe the air from the booth can be cleaned enough so that the tenants will no longer complain.

Some years ago we were confronted with this same problem—and were threatened with immediate ejection by the landlord if the odors were not stopped forthwith. We were making toys and spraying them in our spare time (evenings) and venting our drying room to the air shaft, just as S. H. F. did.

The problem was solved by cutting into the exhaust duct from the spray booth, inserting some fine mesh screen to serve as a filter (see "F" in accompanying drawing), then taking the lacquer-laden air up through a crude but quite effective "scorcher" and releasing it into the air shaft. Just by way of lagniappe [lanyap; a trifling gift] we'd spray a little turpentine or pine oil into

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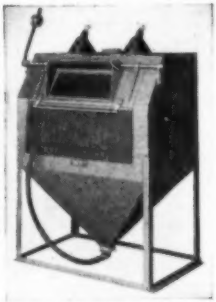

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the outgoing pipe, and the complaints were withdrawn.

The "scorcher" consisted of a discarded oil drum mounted so the exhaust duct from the spray booth entered the bottom, as shown in the accompanying drawing. Some 6-in. from the base we placed a circular gas burner, "B" built up from ½-in. pipe, and connected it to the gas line through a needle valve. An old truck radiator "R," was used as a cover for the "scorcher," serving as fire screen and also to conduct away the heat generated. Water hose was connected to the inlet and outlet of the automotive radiator, one hose being connected to the water tap and the other dropping into the sink to serve as an overflow, this arrangement providing a continuous flow of water through the radiator.

The screen filter "F," put into the line from the spray booth, was made up of several thicknesses of wire mesh. The unit was removable so it could be discarded when fouled.

The accompanying sketch shows the essentials of the fume burning system as we developed it. It proved so effective that we were able to continue the use of our spare space for the side-line occupation without further trouble with landlord or tenants.

NOTE—Further details, requested by the Editor, are as follows:

The "scorcher" was located in a room about 8x10-ft., (with a 7-ft. ceiling) that happened to be between the spraying booth and the enclosed air shaft. As a concession to possible excessive heat, the walls and ceiling adjacent to the drum were protected with sheet asbestos, blocked out from the wall proper on ordinary wood-

en spools to permit air circulation on all sides. That this was unnecessary was proved by the temperature above the radiator top of the scorcher, which was about that of a well-fired steam house-heating regulator.

The burner was lighted through a small hole cut in the side of the drum, just above the burner and at the side where the valve controlling gas flow was located. The hole was closed with a slide during use. In my drawing of the burner you will notice that the lacquer fumes had to pass within a short distance of a gas flame at some point in their travel past the burner. The ½-in. pipe contrivance was welded and had a coupling at each end of the transverse section of pipe serving to bring in the gas, so that the burner could be aligned with the holes through the drum, and the outside lengths of pipe screwed in to hold the burner in place. The fit of pipe and drum was fairly close, but not sealed.

The device was used in Cleveland, Ohio, for some years after it was first set up and, so far as I know, it never met objection from any insurance, fire or health inspector, though it was viewed by men representing all three services during the time we had it in operation.

Regarding the burner, the ends of the circular sections were closed by welding and the holes for gas were drilled 3/64-in. in diameter. A flame about ⅝-in. to ¾-in. in height was carried when the duct fan was running full speed. This was the result of experiments to determine the amount of flame and heat necessary to deodorize the air carried through the device.—E. STERRETT.

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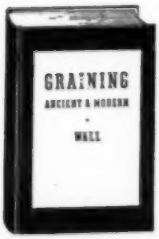

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Mixing Stains for Wood Finishing

In our finishing room we use water stains exclusively in the finishing of piano benches. During the last few years piano colors have doubled and tripled, so to speak, and we have the problem of mixing up small quantities of water stains for special orders, to match the samples, without too much extra coloring or shading.

Our former boss finisher made all of his colors by combining three different stains. In fact, he claimed he could match anything with only maple, walnut, black, red and brown water stains . . . . and only one shade of each at that. These he mixed without any definite formula. Now, until our present finisher gains more experience, we would like to have a more scientific method of matching the various samples with water stains.—H. J. S.

Editor's Note: As an answer to this question, we reprint here part of an article by Mr. F. W. Purdon, which was published in a previous issue of INDUSTRIAL FINISHING. *We will welcome any further suggestions, comments or additional information on this subject.*

Good stains may be purchased, mixed in powder form, for all finishes that belong in the stain category, but it is rapidly becoming the custom for the purchaser of furniture and fixtures to want his own color scheme followed out, and this requires the matching of samples submitted. This is particularly true in the manufacture of office furniture, as most all the executive offices throughout the country require the very

highest class of office furniture, and the finish on same must meet their requirements. The tendency today, in fitting out the large executive offices, is individuality in color scheme. So in this particular branch of wood finishing, there is no end of matching samples.

If the finisher, who is interested in this phase of finishing (mixing stains) and matching colors, will follow along the steps I am about to recommend, he may find some real help here—provided he has been born with an eye for color. Let the finisher first obtain a set of balances with weights, weighing grains, scruples, drams and ounces. In mixing stains it is absolutely important to be accurate in all weights.

First let us consider mahogany. From a good reliable stain house, purchase the following colors: nigrosine jet black, azo rubine extra, croceine orange Y. concentrated, acid yellow, acid green, and a good brown-base Swiss loutre or walnut crystals. For experimental purposes, one pound of each will be sufficient.

What Experiments to Make

Nigrosine jet black is, as its name suggests, a jet black. Take one dram of this and dissolve it in one quart of hot water. For the accurate measurement of water, one should have a tested quart by a graduated glass. Be sure the nigrosine is thoroughly dissolved. Now, on a small part of a mahogany panel, try this color and note the effect produced by it; then add one more dram of nigrosine jet. After this is dissolved, try another small part of the panel, and again note the results obtained by the solution now containing two drams.

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Next, let us take the azo rubine extra. This is the bright strong red. Follow the same steps as you did with the nigrosine jet black. In this way you will gain a knowledge of the color produced by this stain on mahogany. Next, let us consider the qualities of croceine orange Y. concentrated. Again I ask you to follow the same process as you did with the nigrosine jet and azo rubine extra, using one dram to the quart, then two drams.

I trust you will note particularly the tones produced by this stain, as many of the light shades of mahogany are produced with this stain alone—used at various strengths. It is also used as a base for the darker tones on mahogany.

Now follow along the same experimental routine with the acid yellow, acid green, Swiss loutre and the walnut crystals. If you will follow these steps properly you will become familiar with the coloring properties of the stains, as used separately. Then, from the proper combination of these, you can match practically every known color on mahogany. But to do this, you must know the correct proportions of each to use in making the stain.

Now take two drams of croceine orange Y. concentrated, one dram of nigrosine jet black, and dissolve these two colors in a quart of hot water. Try this stain on a mahogany panel. Next, add to this stain two scruples of acid yellow. Try this stain and note the results in change of color. Next, add to this same stain two scruples of azo rubine extra concentrated, and you will see that you have a much redder mahogany.

If you will make several such combinations of colors, using different proportions of the colors each time, you will see there is hardly any limit to the shades and tones you can produce. When you strike a color you like or one you are searching for, finish a small panel and on the back of it, or on a tag attached, write the formula so you will always have it at hand. Here is where you must be sure your weights have been correct, as the least variation in them will produce a different shade of stain when you use the same formula again.

Walnut Mahogany Colors

Next, let us consider the so-called walnut mahogany colors. First you must take into consideration the natural color or tint of the wood, which ranges from a light pink to a near red. If you are going to create a walnut color on mahogany, it is necessary to take care of the reddish cast that is in the natural wood. It is impossible to remove this entirely and too expensive to even partially do it. You must change it into some other tint or, in other words, kill it.

Suppose you take one scruple of acid green and dissolve it in one quart hot water. Try this

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stain on a mahogany panel. The result will be that the red of the mahogany changes into a greenish brown. Now by adding to this stain the right proportions of Swiss loutre, acid yellow and nigrosine jet black—and possibly a little orange yellow—you will be able to obtain a wide range of walnut colors on mahogany.

If you will follow these instructions carefully, make yourself acquainted with the coloring properties of each individual color as dissolved, and then follow out a careful routine of experiments, in a very short time you will adapt yourself in being able to match any mahogany color that may come along. You will also have the knowledge of these colors to use in creating new color schemes for mahogany.

Bichromate of Potash

Bichromate of potash is often used in mahogany stains. This comes in the form of a yellow or red-yellow crystal and should be ground fine to use, as this helps it to dissolve much faster. Bichromate of potash, dissolved in hot water and applied to a wood which does not contain tannin or tannic acid, such as whitewood, leaves just a yellow coloring. But when applied to mahogany, which contains a large percentage of tannin, it develops a deep brown tone that is controlled by the strength of the solution. It is used to give depth and permanency to the stain, as it acts on the tannic acid which is part of the wood itself. Therefore the stain also becomes part of the wood, and is real fast to light and permanent. Bichromate of potash may be used with the above colors and will improve the qualities of the stain.

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Other Finishing Operations

After you have matched a color, do not take it for granted that you are right until you have stained a panel and then sized, sanded and filled it, as these operations all exercise some influence in changing the color. Before you stain your regular run of work, make this test. Then, when you are sure you are right, go ahead, remembering that haste makes waste. Take nothing for granted, only as the facts prove themselves to you.

Can you put out a lacquer fire quickly, so the plant can continue operating next day? Investigate your fire hazards, your fire extinguishers, and what precautions are taken to prevent fires from starting.

M. H. Corbin Joins Standard Varnish Works

The Standard Varnish Works, 386 Fourth Ave., New York, N. Y., announces the appointment of M. H. Corbin to its Technical Sales Development Staff.

Mr. Corbin was formerly connected with the Arco Co., in full charge of all research and development over a period of years.

M. H. Corbin, member of Technical Sales Development Staff of Standard Varnish Works in New York

The acquisition of the services of Mr. Corbin is another step in the policy of Standard Varnish Works, to give the best technical and engineering assistance to its many friends and customers.

Letters from I. F. Readers

(Continued from page 12)

tect the interior of the vessel in such a way that a reasonable protective coating can be secured. This coating must be an air-dry finish, preferably a one-coat job, and can be of any color.

We would like suggestions as to any type of product that can be recommended as satisfactory for this purpose, to be applied either by spraying or by brushing.—D. S. Mfg. Co. (Poultry Equipment).

Burn-in Shellac or Repair Finish

Sometime ago, when reading one of your magazines, I recall reading of a perfected shellac for burning in which was better suited to varnished surfaces than the regular product, such as Dox-stick.

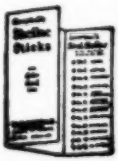
Our problem is this: New furniture finished in lacquer and varnish often is scratched in transit, and we are called in to restore the surfaces. It is a common fault that after burning in and smoothing the burned-in place, the gum appears to sink, and shows very distinctly. Sometimes we are able to polish the surface satisfactorily without coating — and, of course, that is what we are anxious to do, as there may be just a small scratch on a desk top and it is foolish to coat the entire surface.

I will appreciate it if you can advise me what the product is that you had in mind; also, if it can be had in light and dark walnut and light and dark mahogany.—D. C. Co. (Wood Finishing; Antiques).

Sealer Coat Wanted for Hardwood

Will you please be good enough and insert the following in the Questions and Answers column of your next issue, calling it to our attention when it is inserted and kindly forward the answers to us?

"Woodworking plant wishes to know from a lacquer house if it is possible to secure a first binding coat on birch, maple or sap gum wood, kiln dried, for a white, oak or mahogany finish to act as a first coat and at the same time cover the wood entirely, requiring only one or two succeeding coats, and without these coats penetrating beyond this first coat. If any lacquer houses can furnish this material, answer promptly, as we are very much interested—particularly in the white finish."—R. Mfg. Co. (Modern Water Closet Seats).



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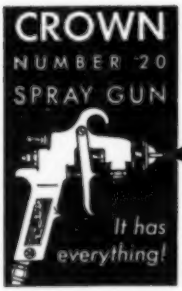

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Coating Machine for Venetian Blinds

Kindly give us the source of supply on a coating machine to coat Venetian blind slats with lacquer.—O. C. Co. (Paint Mfrs.).

Wood Graining on Metal

We are interested in the possibility of applying a wood grain finish to some air-conditioning cabinets. We would appreciate any information you may have, or can direct us to, relating to the equipment required, cost, and who might be in a position to do such work for us.

We would also like some information as to the hand process of wood graining. We would greatly appreciate any information you can give us on this general subject.—H. R. Co. (Heaters; Ventilators).

Baking Lamps

The S— Lacquer Co. 'phoned this morning and asked if we could put them in touch with a manufacturer of lamps for baking purposes. I believe this company is a distributor and they would like to make a connection with such a manufacturer. Will you kindly advise them and convey the information to some baking lamp manufacturer friends of ours?—I. F.'s N. Y. Representative.

EDITOR'S NOTE—A manufacturer of electric baking lamps (for baking a patch or repaired place in a baked finish) is located here in Indianapolis, Ind.

Lacquer Strainers

We manufacture kites and the assembly of this is all hand work. From time to time we have tried out other items to work on during our dull season. Last summer we tried out, in a small way, the making of lacquer strainers and find that it fits in with our production method very nicely; no new or different machines are necessary.

However there are so many things that we don't know about lacquers that we would appreciate it very much if you could give us the name of some person who could give us this information. We would want to know if all lacquers have to be strained before spraying. Does lacquer have such properties that, after being exposed to the air, some re-

action takes place which makes it necessary to strain? Of what is lacquer made? We are interested in anything bearing on lacquers and their uses, particularly when sprayed.

We would of course want to know the use of strainers—who buys them, how distributed, price, and what cloth or fabrics are best for straining, etc.—R. G. Co.

Back Copies of I. F.

We are very much interested in some articles which appeared in past issues of your magazine. If at all possible we would appreciate your sending us a copy of the October 1936, December 1936 and August 1937 editions.—H. S. P. (Bus Bodies).

Is Today's Finish Better?

I have been a finisher for over 20 years; starting in the finishing room as a bench worker and working myself up to a foreman finisher. I remember well how we did all our work by brush. If we did 80 to 90 chairs a day on first coat in the old method of finishing, it was considered a good day's work.

In 1926 I installed a spray machine for the company I was working for to try it out. We were able to produce four times the amount with the spray gun than we had produced with the brush.

I have noticed the advancement in the hand rubbing machine and the development of new finishing materials such as lacquers and synthetics, which have speeded up the old way of working. We got at least eight days to finish and rub our work. The same job is done today many times in one day with lacquer. I would like to ask the old time finishers what their opinions are on this question: Are we getting a better finish today than we were 15 years ago by the speed-up system we are using today?—R. Boon.

Rubbing Compound

We have been asked by one of our customers to recommend the best rubbing compound to use with their rubbing machines, for rubbing smooth the final lacquer finish on their furniture.

At the present time they are using a sealer coat which they dry sand and on top of which they apply the desired amount of the right sheen of a lacquer; and after this is dry, they rub it entirely smooth, using a rubbing compound which happens to be at this time, linseed oil cut back with naphtha, but they have asked our opinion if we think there is a beter one than what they are now using.

Will you please let me hear from you regarding this at an early date? Inasmuch as we take your magazine and have found it very useful, I have taken the liberty upon myself to make this request of you.—E. H. Co. (Finish Mfr.).

Sands Anything

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Luminous Paint

In your September issue, in the column of questions and answers, I was attracted to the subject of luminous paint. We are interested in such a product and would appreciate receiving from you the name of the manufacturers who market this item for practical use. Incidently, any data you may have relative to the nature and behavior of luminous paint would be appreciated by the writer.

We look forward with real interest to receiving your magazine monthly. —E. A. Corp. (Paint and Varnish Products).

Metal Sprayer

I would like some information regarding a metal spraying gun mentioned in an old issue of INDUSTRIAL FINISHING (March 1933). Who makes them? Can they be used for solder and would they be practical for use on a production line? If you know of any company locally (Detroit, Mich.) that is using them, I would appreciate having their name and address.—W. T. S.

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New Finishing Materials in Review

(Continued from page 66)

Synthetic Finish — For mechanical rubber, hard rubber, tile and synthetic compositions. Available in all colors; has unexcelled mar-proofness, flexibility and appearance.—219

Black Baking Japan—Gives a two-coat effect in one coat; is recommended especially for enameling cast iron or porous metals; available in high gloss or semi-luster; can be sprayed or dipped.—220

Fast Baking Enamels—For dipping or spraying; one coat covers solid; bakes in 10 to 12 minutes; available in all colors; recommended for sheet metal parts, toys and automotive parts.—221.

Marproof White Enamel—For dipping steel furniture, partitions, filing cabinets, etc. One coat covers black iron with high luster; bakes at varied time and temperatures; available in colors.—222

1542 Type Clear "Duco"—The outstanding virtue of this product is that the film dries rapidly to a highly print resistant condition. Other qualities such as clarity and scratch resistance are excellent. Particularly suitable for use when rapid finishing schedules (rubbing within six to eight hours after final coat, and packing within two or three hours after rubbing) are required.—217

"Preparakote"—A quick-drying type primer used chiefly in the finishing of automobiles and commercial vehicles. Unlike most primers, it also fills and may be sanded. It is available in three colors—red oxide, white and gray; may be applied to body steel, non-spangled galvanized metal, other non-ferrous metals, such as cadmium plate and alloys of aluminum, chrome trested magnesium.—218

1753 Type Clear "Duco" — This product is similar to the 1542 type. However, it dries even more rapidly to an even higher print resistant and scratch resistant condition of film.

The rapid hardening qualities make it necessary to rub this product in not less than 24 hours after the last coat has been applied. Particularly suitable for use on office desks and furniture where quick print resistance, rapid processing schedules, and excellent scratch and mar resistance are of prime importance.—211

1590 Type Clear "Duco"—Especially suitable for use as a piano finish, possessing unusually good durability, scratch resistance, and cold-crack resistance.—212

Moistureproof Paper Lacquers—Improved moistureproof lacquers for application to paper. In addition to possessing the usual qualities of gloss, flexibility and wear resistance, they also possess the quality of imparting to the lacquered papers a resistance to the passage of moisture vapor. This quality of moistureproofness is of the order of that possessed by moistureproof "Cellophane" cellulose film.—213

Flexible Enamel (218-Line) — The 218-Line Enamel is designed as a one-coat finish for direct application to metal. It has been designed to cover in one double coat when thinned equal parts; has excellent flexibility and adhesion and is free from a tendency to self-lift upon recoating.—214

Galvanized Metal Primer—Recommended for exterior painting where the problem of securing satisfactory adhesion to bare galvanized metal surfaces is important. Experience with this product shows it to give far better adhesion to galvanized metal than previous products; requires no chemical wash, but merely a clean surface; is supplied in a two-compartment container, the contents of which are stirred together prior to application; may be applied by spray, brush or roller coat. It is recommended that a finishing coat of paint be applied over it, although it has shown exceptional durability when exposed without any finishing coats.—215

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EDITORIAL

Hold On To This Issue of Industrial Finishing

Requests for additional copies of January issue of INDUSTRIAL FINISHING, which contains the Annual Review of New Finishing Materials, have been so great during past years that our supply of office copies is quickly exhausted. We urge every reader, therefore, to preserve this copy of the magazine for present and future reference. Share it with one or more interested individuals, if you have the opportunity, but please do not allow it to become lost or destroyed.

This year the Annual Review article is more interesting, more informative and more valuable than in any preceding issue. An additional feature this year is the Buyers' Guide, which is particularly valuable as a business reference.

These two features, together with the several original editorial articles and many interesting display advertisements make this January issue unusually valuable to everyone identified in any way with the finishing of industrial products.

Care in Buying and Selling Finishing Materials

While it may seem idealistic to some, nevertheless it is a practical truth that in every successful transaction both the seller and the buyer must be satisfied with the results. This applies particularly in the sale of finishing materials and especially in a case where the buyer is changing to another source of supply.

If the purchaser of a quantity of finishing material meets with disappointing results, through no fault of his own, when he uses the material a salesman recommends, he is certainly in no mood to patronize that salesman or that company again. Of course, the seller may strive to make a satisfactory adjustment, but that all takes time and it's difficult to restore confidence after a failure in performance. It is better for a company about to sell a new customer to spend more time and care in finding out just what is needed and then try to furnish

exactly the material to do the job perfectly. A case to point is revealed in a foreman finisher's recent letter to the Editor. He says:

"Working for a concern that is always looking ahead for new finishes and trying out the latest ones as they are put on the market, I can truthfully say I know what I am talking about. We are now using synthetic and have been using it since it came out, and as everyone knows it has opened a great competitive field for all paint manufacturers, and all of the salesmen are out to sell their products.

"Having used a good synthetic material from an old established concern and being satisfied until another salesman called and offered us the same material at a price below what we were paying, and being ready to try something to reduce our cost but keep up our quality, we tried a sample of this material. We submitted a wet sample of our present material and ordered four drums—one each of four colors, giving the full particulars as to baking time, production and spraying conditions.

"We stated to the salesman that we wanted the material to be made the same as the old material —as far as body, base material and reductions were concerned.

"We received the four drums and started into production with the new materials. While using the first five gallons we ran into considerable trouble. Two of the light colors separated, and the darker colors baked too dark in the required baking time. We immediately called the salesman and told him what was wrong. He came over and brought along the company chemist. We showed him his material as it was being run through on the line. After checking over his material his only explanation was that the material separated and that he would have to build the base material up so that we could use it.

"We questioned him regarding how he made this material and asked him if he had followed the same base material and body as the wet sample we had submitted to him. He admitted he had not, but that he had built it up after his own idea and formula. After finding out what he had done and the trouble his material had caused us, we returned the material to the company and went back to the old concern and are still with them today."

New Year's Resolution

"Watch your Quality, Costs and Safety." Easy to say; difficult to do; but men's jobs and companies' business are going to depend upon these three elements this year more than ever before. They are points to be kept in mind constantly. Executives and workmen, individually and collectively, should leave nothing undone that will help to promote better quality workmanship, more accuracy, added economy in production costs and greater safety in the plant.

When quality in materials and workmanship are satisfactory and when costs are accurately figured and low enough to make selling prices attractive, the factory's goods will sell — provided they have the necessary style features and utility value. And where there is plant safety the factory can continue operations without costly interruptions and without pay-

ing a heavy penalty for extreme and unnecessary hazardous conditions.

These merits of Quality, Cost and Safety are not just the bosses' responsibility. Since they affect everyone in the organization, then everyone from the top executive down to the lowest paid employe should be quality conscious, cost conscious and safety conscious all the time.

The employe who refuses to be concerned about any one of these three vital items should be dismissed immediately. His presence in the establishment will eventually be harmful to himself and to others in the plant. Materials, equipment and supplies are carefully selected. See also that the workmanship and incidental nonproductive help, skilled and unskilled, is just as carefully selected.

Make Oven Heat Effective

It is interesting to note the progress being made industrially in the matter of finishing baking ovens, and the care being exercised both in oven design and operation in order to minimize the escape of heat. Obviously, there will always be some heat escaping, but modern oven construction is far ahead of the old-time methods, and this has resulted in real heat economy.

In the progressive type of oven fitted with a traveling conveyor, a method often used in design takes advantage of the well-known fact that heat tends to rise. With this in mind, the center-length of the progressive oven is high, thus causing the heat to move toward the center rather than toward the end doors. Another thing that is closely watched is the proposition of having oven doors open just as little as possible. It is especially important to avoid having doors open at both ends of a progressive-type oven at the same time, since this would allow a direct draft, and would lower the oven temperature considerably. Among the different ways in which this could be arranged, the opening of a door at one end could be made to close an electric circuit which, in turn, would operate an electric lock on the door at the opposite end. Compressed air cylinders, properly laid out and valved, could probably be used for this purpose also.

Warm Finishing Room

Finishers can get into extra trouble during the winter months because of the fact that lower temperatures and cold drafts have a bad effect upon their finishing materials. Really, the temperature of the finishing room, the materials, equipment and surfaces to be finished should be close to 70°F.—not lower than 65°F. Materials brought in from cold storage should not be used until their temperature has been gradually raised to the temperature of the warm room in which they are to be applied. And this goes for the products and surfaces to be coated also; and for the equipment used.

Naturally, these matters are properly taken care of in well equipped factories, but what about the thousands of shops where conditions are far from ideal—where the temperature is 40 or 50°F. when the finisher arrives in the morning? The temperature of everything concerned

will have to be raised. A working balance must be maintained if satisfactory results are expected. There is no use trying to spray heated finishing materials in a cold room or onto cold surfaces. The warm finishing materials will become quickly chilled and that means trouble later.

Be careful about warming any finishing material. Keep it away from the flames or excessive dry heat. Keep the material water-jacketed at the bottom and sides of its container. Oven heating a container of finishing liquid is dangerous. Heating the finishing material, of course, thins it and that must be taken into consideration in connection with its application to surface to be coated.

Synthetic Surface Coatings Book

An uptodate and practical informative book about "The Chemistry of Synthetic Surface Coatings" has been written by an outstanding authority, Dr. Wm. H. Krumbhaar, Vice President in charge of technical delevopment for Beck, Koller & Co., Inc., and has been published by Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. The book contains 200 pages 5¾x9-in.; is illustrated and alphabetically indexed; is printed in large type on high grade enamel paper, and is bound between stiff covers in dark brown and green. It is strictly a high class text and reference book on a subject of timely interest to all users and manufacturers of paints, varnishes, lacquers and synthetics. Price $4.00.

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The Eclipse Air Brush Co., Inc., announce the removal of their office and factory to 390 Park Ave., Newark, N. J., after 29 years in downtown Newark.

The building formerly occupied by the company was damaged by fire on

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Veneer-ite Process Patent Valid

Finishing Systems, Inc., of Louisville, Ky., owner of the Veneer-ite Patent No. 2,065,322, granted Dec. 22, 1936, announces final settlement of its Veneer-ite patent litigation with Elkin Furniture Co., Elkin, N. C.; with Huntingburg Wood Products Co., Inc., Huntingburg, Ind., and with Camden Furniture Co., Camden, Ark.

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